



SEMICONDUCTOR FFKM O-RING MARKET

- Global Outlook and Forecast 2022-2028

SUMMARY

This report contains market size and forecasts of Semiconductor FFKM O-ring in global, including the following market information:

Global Semiconductor FFKM O-ring market revenue, 2017-2022, 2023-2028, (\$ millions)

Global top five Semiconductor FFKM O-ring companies in 2021 (%)

Global Semiconductor FFKM O-ring market size in terms of revenue is projected to reach 346.13 Million USD by 2028 from 212.55 Million USD in 2022, with a CAGR 8.47% during 2022-2028.

High Temperature Segment to Reach \$ 216.96 Million by 2028, with a 7.83% CAGR in next six years.

The global key manufacturers of Semiconductor FFKM O-ring include Dupont, Greene Tweed, Trelleborg, Freudenberg, TRP Polymer Solutions, Gapi, Maxmold Polymer, Yoson Seals, Precision Polymer Engineering (PPE), etc. In 2021, the global top five players have a share approximately 46.68% in terms of revenue.

MARKET MONITOR GLOBAL, INC (MMG) has surveyed the Semiconductor FFKM O-ring manufacturers, suppliers, distributors, and industry experts on this industry, involving the sales, revenue, demand, price change, product type, recent development and plan, industry trends, drivers, challenges, obstacles, and potential risks

Total Market by Segment:

Global Semiconductor FFKM O-ring market, by Temperature Range, 2017-2022, 2023-2028 (\$ millions) & (K Pcs)

Global Semiconductor FFKM O-ring market segment percentages, by Temperature Range, 2021 (%)

- High Temperature
- Extreme High Temperature

Global Semiconductor FFKM O-ring market, by Application, 2017-2022, 2023-2028 (\$ Millions) & (K Pcs)

Global Semiconductor FFKM O-ring market segment percentages, by Application, 2021 (%)

- Plasma Process
- Thermal Process
- Wet Chemical Process
- Others

Global Semiconductor FFKM O-ring market, by region and country, 2017-2022, 2023-2028 (\$ millions) & (K Pcs)

Global Semiconductor FFKM O-ring market segment percentages, by region and country, 2021 (%)

- North America
 - US
 - Canada
 - Mexico
- Europe
 - Germany
 - France
 - U.K.
 - Italy
 - Netherlands
 - Rest of Europe
- Asia
 - China
 - Japan
 - South Korea
 - Southeast Asia
 - India
 - Rest of Asia
- South America
 - Brazil
 - Mexico
 - Rest of South America
- Middle East & Africa

Competitor Analysis

The report also provides analysis of leading market participants including:

Key companies Semiconductor FFKM O-ring revenues in global market, 2017-2022 (estimated), (\$ millions)

Key companies Semiconductor FFKM O-ring revenues share in global market, 2021 (%)

Key companies Semiconductor FFKM O-ring sales in global market, 2017-2022 (estimated), (K Pcs)

Key companies Semiconductor FFKM O-ring sales share in global market, 2021 (%)

Further, the report presents profiles of competitors in the market, key players include:

- DuPont
- Greene Tweed
- Trelleborg
- Freudenberg
- TRP Polymer Solutions
- Gapi
- Maxmold Polymer
- Yoson Seals
- Precision Polymer Engineering (PPE)
- Fluorez Technology
- Applied Seals
- Parco (Datwyler)
- Parker Hannifin
- CTG
- Ningbo Sunshine

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1 Introduction to Research & Analysis Reports

1.1 Semiconductor FFKM O-ring Market Definition

Semiconductor FFKM O-rings are the highest high-performance family of O-rings with the highest temperature (up to 620F) and ultimate chemical resistance. FFKM O-rings are specifically manufactured for extreme applications where up time performance is worth the significantly higher cost compared to other basic materials. They can be used in thermal, plasma and wet chemical semiconductor etc processes.

Figure 1. Semiconductor FFKM O-ring



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

The Global Semiconductor FFKM O-ring market comprises a wide range of products suitable for use within the Global domestic market. In order to quantify and analyse the market, our definition of the market includes the following key product sectors:

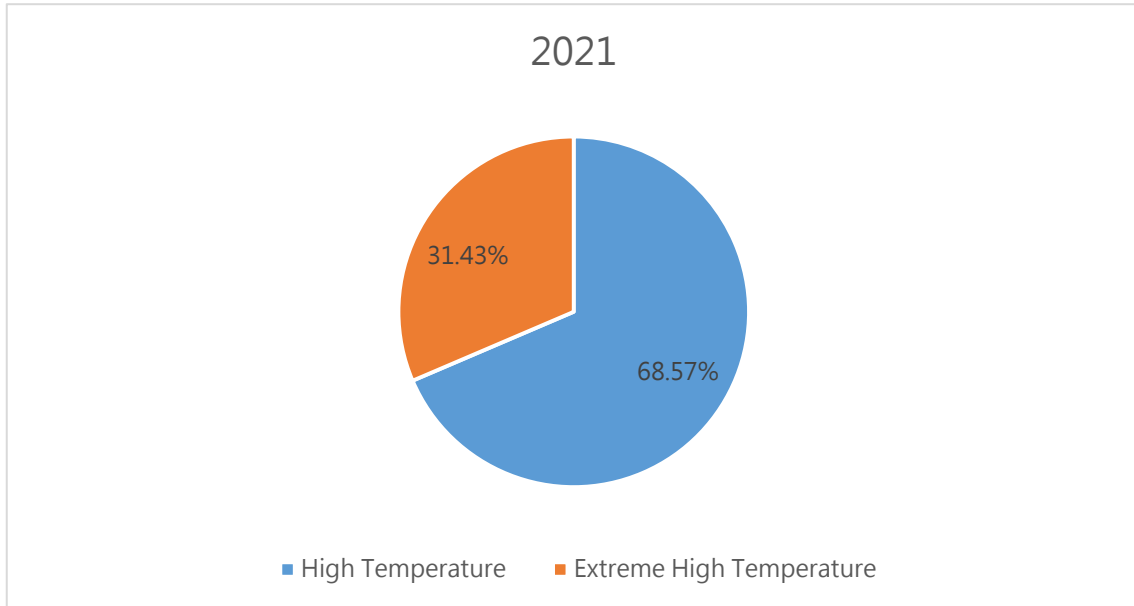
This report specifically excludes labour and measures the product values at manufacturers selling prices. value-added tax, import duties and transportation fees are excluded as well as labour other delivery charges. Whilst we have made every effort to exclude commercial applications, there may be some light commercial applications included within the overall market sizes quoted.

Where volume figures are illustrated for the overall market, these are provided as number of sales. The geographical coverage for this report is the Global and includes domestically manufactured and imported products.

1.2 Market Segments

1.2.1 Segment by Temperature Range

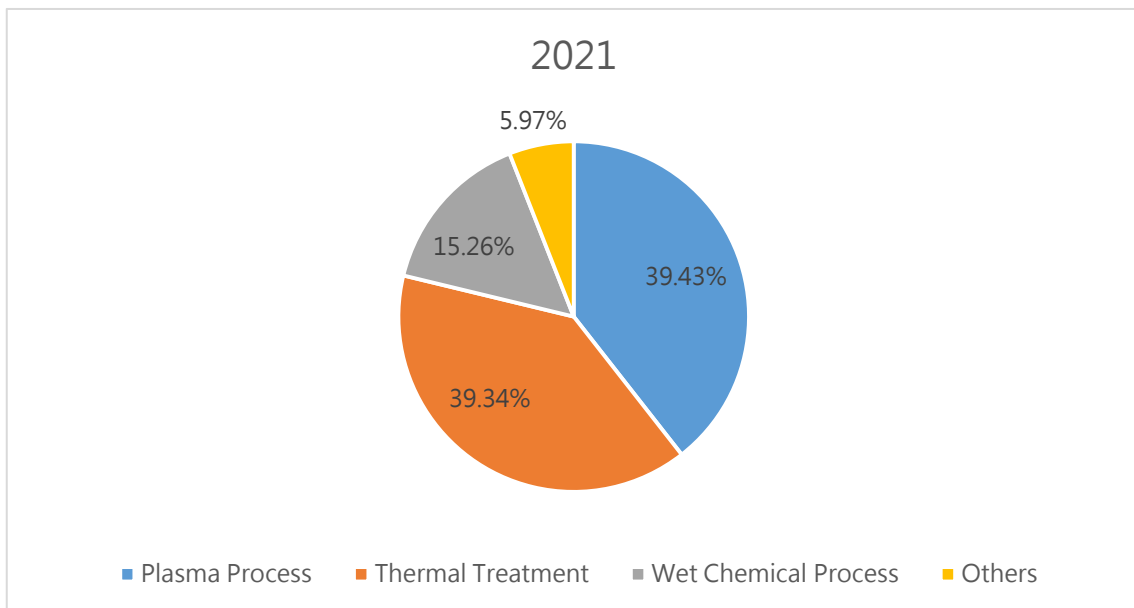
Figure 2. Semiconductor FFKM O-ring Segment by Temperature Range in 2021



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

1.2.2 Segment by Application

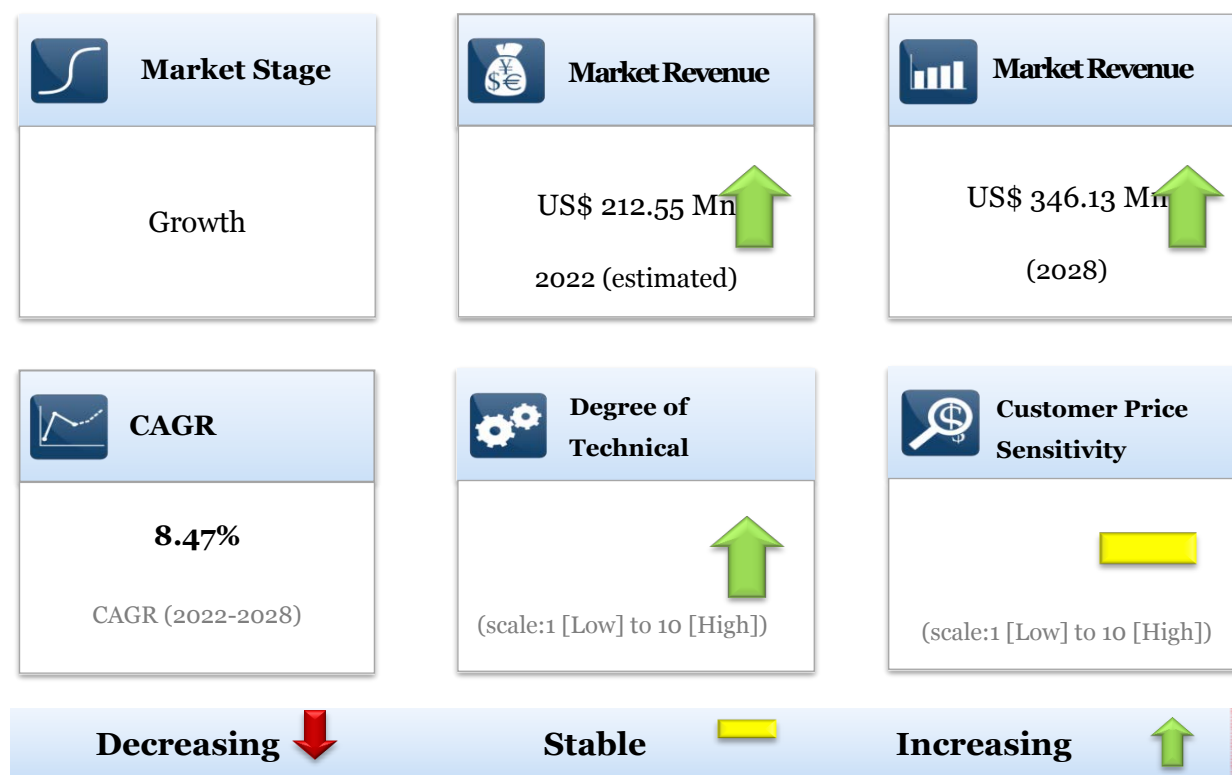
Figure 3. Semiconductor FFKM O-ring Segment by Application in 2021



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

1.3 Global Semiconductor FFKM O-ring Market Overview

Figure 4. Global Semiconductor FFKM O-ring Market Overview: 2020



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

1.4 Features & Benefits of This Report

MARKET MONITOR GLOBAL, INC (MMG)'s market reports provide an independent, comprehensive review of recent, current and future market size and trends in an easy to reference format. Each report provides vital market intelligence in terms of size, product mix, end use mix, SWOT, key trends and influences and industry structure trends. In addition, rankings by revenue, sales and market share for the market leaders are provided as well as company profile for each key player in the market.

Based on company sales returns which provide higher confidence levels and researched by market research professionals with experience in the industry, MARKET MONITOR GLOBAL, INC (MMG)'s Research and Analysis reports are used as a foundation for coherent strategic decision making based on sound market intelligence and for developing effective marketing plans. MARKET MONITOR GLOBAL, INC reports can also be used as an operational sales and marketing tool by identifying market leaders, enabling the reader to quickly grow sales to new clients and focus marketing budgets.

This report includes:

Market Size, PEST, SWOT & Trends – Historical, Current & Future

Based on sales data from a representative proportion of the industry, this report provides market size by value over a ten-year period. As they are based on quantitative data as well as qualitative input from the industry, our reports are more accurate than other qualitative based reports and offer better value for money. By combining the best of both quantitative and qualitative input, we offer our clients greater confidence in our market forecasts as well as discussing key market trends and influences from a qualitative perspective.

Product Mix – Current & Future

This report identifies the key product sectors in the market and provides historical, current and forecast market share estimates for each, alongside qualitative discussion on key trends for each segment of the industry. With input for this report being both qualitative and quantitative we are able to offer an effective insight into the core components of the market, as well as forecasting future market shares.

Distribution Channel Mix

The report identifies the key channels that drive demand for this market and provide a current, historical & future market share estimate for each. This enables the reader to identify the key driving forces behind current market demand and adapt business tactics accordingly. With forecasts of market share by key channels also provided, the reader is able to undertake strategic decisions with greater confidence as well as basing marketing strategies on solid market intelligence.

Semiconductor FFKM O-ring Manufacturers (Players) Profiles & Sales Leads

This report includes company profile for leading Semiconductor FFKM O-ring manufacturers, including company details, Semiconductor FFKM O-ring sales, revenue, price, manufacturing factories, product category, enabling the reader to quickly gauge the current key figures of a company.

1.5 Methodology & Sources of Information

1.5.1 Research Methodology

Evaluation of Market Dynamics

This phase includes a detailed evaluation of several factors that are likely to affect the market dynamics. It involves a comprehensive assessment of major market pain points, drivers, and trends. It also comprises a detailed study of research plans and methodology.

Collection of Data

This process consists of gathering data, accessing proprietary databases, and reaching out to key industry participants that operate in the market across the value chain. It also involves studying several patterns in the historical data and comparing it with the current scenario.



Identification of data

This step involves identification of several primary and secondary data research sources, including Our internal data sources. The primary sources consist of in- depth discussions and interviews with policy makers, industry experts, and data evaluators, whereas secondary sources include a thorough study of market journals, press releases, annual reports, and government and non-government agencies websites

Collaboration of Data

This stage involves the validation of data and arrival at actual statistics, and evolution of the market over the years. It entails the study and analyzes various segments and verticals of the market. An impact analysis is also performed to observe which factors will affect the market in the next few years.

Verification and Analysis

This is the final stage, which involves both quantity and quality checks. Although the process of data verification is an integral part of the research process, all data points and statistics and figures are re-checked to uphold their authenticity and validity.

1.5.2 Research Process



1.5.3 Base Year

The report considers *2021 as the base year*. All calculations involving quantitative data are based on 2019. The values represented in the report are actual values for 2021, whereas *the values are estimated for the period 2022–2028*.



- Study period: 2017 to 2028
- Base year: 2022
- Forecast period: 2023 to 2027
- Short term: 1 to 2 years
- Medium term: 3 to 4 years
- Long term: 5 to 10 years

1.5.4 Report Assumptions & Caveats

Figure 5. Key Caveats

Parameters



Economic Outlook



Currency Fluctuation



Political Outlook



Data Authenticity



Accuracy and Reporting



Vendors

Assumptions

While forecasting the market outlook, no macroeconomic collapses and recessions are predicted about the global economic landscape

Market forecasting was carried out under the assumption that the value of the USD (\$) is likely to remain constant during the forecast period

While arriving at the market size, the global political environment was assumed to remain stable during the forecast period

Revenues and segment-specific information were derived from annual reports of respective companies. The information is assumed to be authentic. However, revenues for the non-listed companies were derived from various authentic publications, news articles, and primary sources

All figures mentioned in the study were rounded to the nearest decimal place. Thus, the summation of figures and percentages may differ by a margin of 0.01

This report provides a list of vendors that are active in this industry. It includes vendors across all geographical regions. The report identifies vendors on the based on their market revenue and dominance in terms of market experience, regional presence, the portfolio of their products, sales, revenue and the popularity of their brands.

MARKET MONITOR GLOBAL, INC (MMG) employ a wide ranging, reliable methodology in order to ensure the highest quality of information possible. Our reports are unique in that they are based on sales from a representative sample of the industry, supported by intelligent qualitative research to provide a comprehensive and intelligent market review. By combining primary and secondary research information, MARKET MONITOR GLOBAL, INC (MMG) reports uniquely offer an unparalleled level of confidence in terms of market data and trend comment. This coupled with the fact that we've been writing reports on these markets since 2010 means that we are confident you won't find a better report available.

Sources of information for this report included:

- Financial Data from Leading Semiconductor FFKM O-ring Manufacturers, Retailers & Distributors.
- Discussions with Manufacturers, Distributors, Retailers & End Users
- Distribution Analysis – including intermediate visits, distributors’ product mix etc.
- Product Information – technical data from manufacturers, distributors etc.
- Company Websites – Manufacturers, Distributors, Retailers, End Users etc.
- Annual Reports – Manufacturers and Distributors’ Company Literature
- Press Releases – New product launches, company news etc.
- Official Statistics
- Revenue & Customs
- Social Media – Facebook, Twitter, LinkedIn, Instagram etc.
- Trade Journals - Printed Journals, Industry Websites and Industry Commentators
- Trade Associations, Conferences and Exhibitions

The research & analysis process involves:

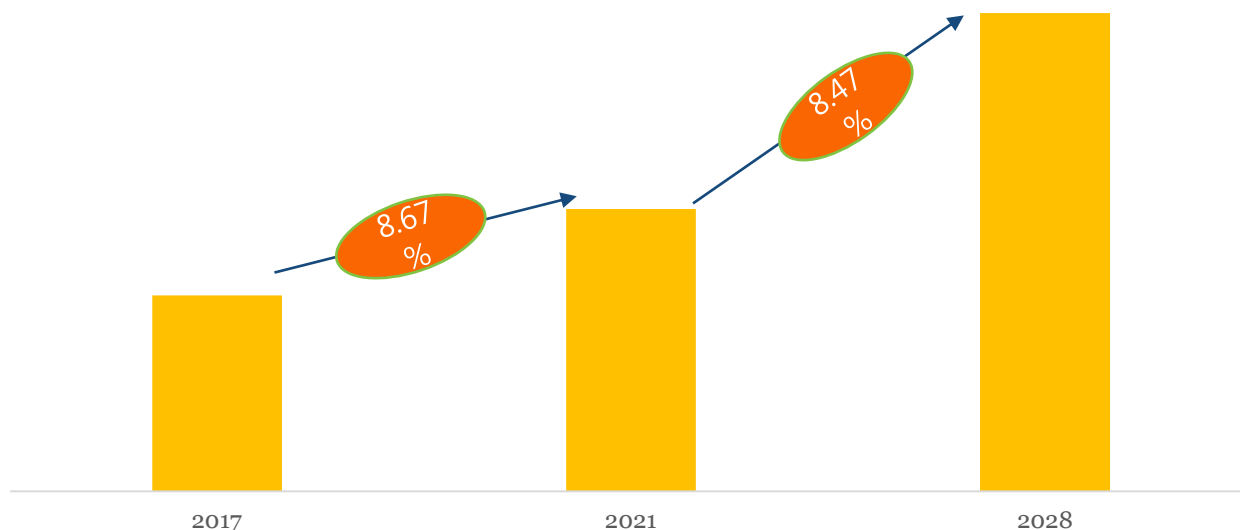
- Qualitative Analysis – collate all primary and secondary information sources
- Quantitative Data Modelling – using MARKET MONITOR GLOBAL, INC (MMG)’s proprietary data processing for forecasts
- Qualitative Review – review data models against qualitative inputs for trends, sizes etc.
- Product Trend Analysis – identify & review trends for each key product sector
- Distribution Channels Review – channel shares & trends analysis
- Sector Review – identify key target markets, key trends in each sector
- Strategic Marketing Review – by qualified, experienced marketing professionals
- PEST & SWOT – review of all market influences, opportunities and threats
- Identify ‘Quick Wins’ – List current and future opportunities for market / sales growth
- Sales/Revenue – Estimate for every company in report, regardless of size
- Economic Analysis – forecasts of GDP, inflation, employment, interest rates etc.

The above involves 8-10 weeks of combined research & report production time, resulting in an intelligent, comprehensive and usable report identifying immediate opportunities and offering a strategic perspective of the market.

2 Global Semiconductor FFKM O-ring Overall Market Size

2.1 Global Semiconductor FFKM O-ring Market Size: 2021 VS 2028

Figure 6. Global Semiconductor FFKM O-ring Market Size: 2021 VS 2028 (US\$, Mn)



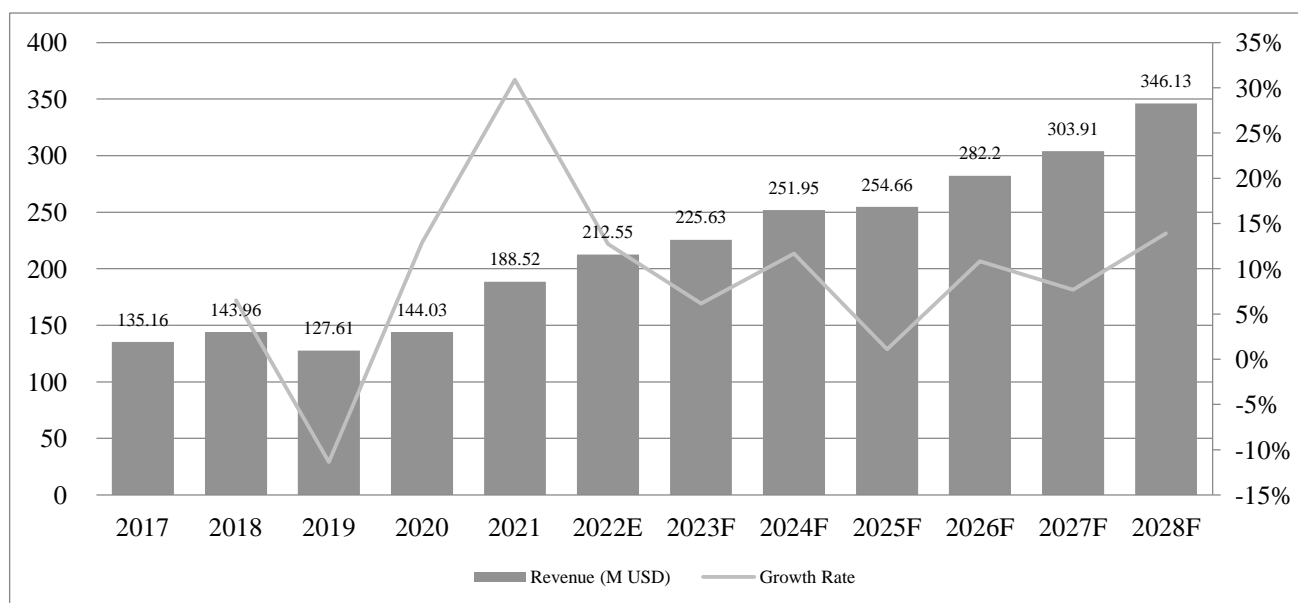
SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

2.2 Global Semiconductor FFKM O-ring Market Size, Prospects &

Forecasts: 2017-2028

The following chart illustrates the performance of the Global Semiconductor FFKM O-ring market since 2017 and forecast to 2028: (figures changed for sample).

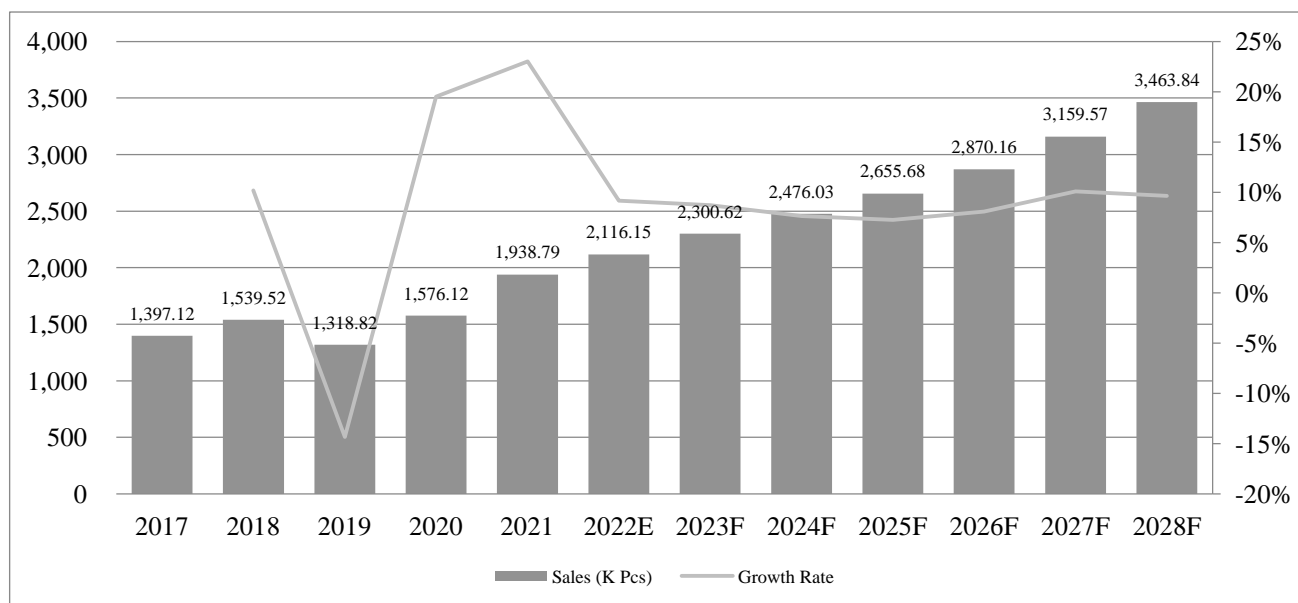
Figure 7. Global Semiconductor FFKM O-ring Revenue: 2017-2028 (US\$, Mn)



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

2.3 Global Semiconductor FFKM O-ring Sales: 2017-2028

Figure 8. Semiconductor FFKM O-ring Sales in Global Market: 2017-2028 (K Pcs)



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

3 Company Landscape

The Semiconductor FFKM O-ring market in global comprises multiple participants in the vendor space. The vendors in this market are:

3.1 Top Semiconductor FFKM O-ring Players in Global Market

Table 1. Key Players of Semiconductor FFKM O-ring in Global Market

No.	Company	Plant Locations	Headquarters
1	Dupont	Europe, USA, China	USA
2	Trelleborg Group	USA	USA
3	Greene Tweed	USA, Asia, Europe, Middle East	USA
4	Maxmold Polymer	Taiwan	Taiwan
5	Fluorez Technology	Taiwan	Taiwan
6	Applied Seals Co. Ltd.	Taiwan	Taiwan
7	TRP Polymer Solutions	UK	UK
8	Yoson	China	China
9	Gapi	Italy	Italy
10	Parco	United States	United States
11	CTG	USA	USA
12	Precision Polymer Engineering (PPE)	UK, USA	UK
13	Parker Hannifin	Americas, Europe, Asia, Africa	USA
14	Ningbo Sunshine Sealing Technology Co., Ltd	China	China
15	Freudenberg	Germany	Germany

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

3.2 Top Global Semiconductor FFKM O-ring Companies Ranked by Revenue

Table 2. Top Semiconductor FFKM O-ring Players in Global Market, Ranking by Revenue (2021)

Rank	Company	Revenue (US\$, Mn)	Market Share (%)
1	DuPont	21.98	11.66%
2	Greene Tweed	18.24	9.68%
3	Trelleborg	18.19	9.65%
4	Freudenberg	13.53	7.18%

5	TRP Polymer Solutions	15.59	8.27%
6	Gapi	14	7.43%
7	Maxmold Polymer	11.72	6.22%
8	Yoson Seals	12.18	6.46%
9	Precision Polymer Engineering (PPE)	10.43	5.53%
10	Fluorez Technology	9.28	4.92%
11	Applied Seals	7.61	4.04%
12	Parco (Datwyler)	6.82	3.62%
13	Parker Hannifin	2.48	1.32%
14	CTG	1.71	0.91%
15	Ningbo Sunshine	1.01	0.54%
	Other Players	23.75	12.60%
	Total	188.52	100%

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

3.3 Global Semiconductor FFKM O-ring Revenue by Companies

Table 3. Global Semiconductor FFKM O-ring Revenue by Companies, (US\$, Mn), 2017-2022

Revenue (US\$, Mn)	2017	2018	2019	2020	2021	2022
DuPont	15.37	16.24	15.59	16.67	21.98	25.29
Greene Tweed	13.30	14.19	12.06	14.55	18.24	20.36
Trelleborg	12.83	13.97	12.38	14.58	18.19	19.81
Freudenberg	11.35	11.01	9.76	11.60	13.53	15.71
TRP Polymer Solutions	10.51	11.82	10.45	12.56	15.59	17.38
Gapi	9.48	10.62	9.34	10.99	14	15.61
Maxmold Polymer	8.68	8.14	7.32	9.63	11.72	14.25
Yoson Seals	8.12	8.85	7.73	8.27	12.18	13.81
Precision Polymer Engineering (PPE)	6.89	7.78	7.19	8.59	10.43	12.00
Fluorez Technology	5.88	6.64	5.68	7.24	9.28	10.28
Applied Seals	4.96	5.69	5.15	6.45	7.61	9.01
Parco (Datwyler)	5.18	5.14	4.61	5.10	6.82	7.32
Parker Hannifin	2.48	2.44	2.07	2.23	2.48	2.51
CTG	1.70	1.66	1.45	1.59	1.71	1.79
Ningbo Sunshine	0.99	1.02	0.89	0.96	1.01	1.04
Others	17.44	18.75	15.94	13.02	23.75	26.38
Total	135.16	143.96	127.61	144.03	188.52	212.55

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

Table 4. Global Semiconductor FFKM O-ring Revenue Share by Companies, 2017-2022

Company	2017	2018	2019	2020	2021	2022
DuPont	11.37%	11.28%	12.22%	11.57%	11.66%	11.90%
Greene Tweed	9.84%	9.86%	9.45%	10.10%	9.68%	9.58%
Trelleborg	9.49%	9.70%	9.70%	10.12%	9.65%	9.32%
Freudenberg	8.40%	7.65%	7.65%	8.05%	7.18%	7.39%
TRP Polymer Solutions	7.78%	8.21%	8.19%	8.72%	8.27%	8.18%
Gapi	7.01%	7.38%	7.32%	7.63%	7.43%	7.34%
Maxmold Polymer	6.42%	5.65%	5.74%	6.69%	6.22%	6.70%
Yoson Seals	6.01%	6.15%	6.06%	5.74%	6.46%	6.50%
Precision Polymer Engineering (PPE)	5.10%	5.40%	5.63%	5.96%	5.53%	5.65%
Fluorez Technology	4.35%	4.61%	4.45%	5.03%	4.92%	4.84%
Applied Seals	3.67%	3.95%	4.04%	4.48%	4.04%	4.24%
Parco (Datwyler)	3.83%	3.57%	3.61%	3.54%	3.62%	3.44%
Parker Hannifin	1.83%	1.69%	1.62%	1.55%	1.32%	1.18%
CTG	1.26%	1.15%	1.14%	1.10%	0.91%	0.84%
Ningbo Sunshine	0.73%	0.71%	0.70%	0.67%	0.54%	0.49%
Others	12.90%	13.02%	12.49%	9.04%	12.60%	12.41%
Total	100%	100%	100%	100%	100%	100%

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

3.4 Global Semiconductor FFKM O-ring Sales by Companies

Table 5. Global Semiconductor FFKM O-ring Sales by Companies, (K Pcs), 2017-2022

Quantity (K Pcs)	2017	2018	2019	2020	2021	2022
DuPont	194.54	210.89	192.49	222.23	274.71	308.45
Greene Tweed	101.53	110.86	92.78	115.44	142.49	154.22
Trelleborg	93.66	102.74	86.60	104.88	126.35	134.76
Freudenberg	93.05	92.48	80.65	97.50	110.02	120.82
TRP Polymer Solutions	84.10	96.89	82.94	102.94	126.71	135.76
Gapi	101.93	116.65	99.32	119.42	147.35	157.66
Maxmold Polymer	55.67	55.02	46.92	63.35	74.16	86.36
Yoson Seals	140.06	160.87	135.61	147.60	206.45	230.14
Precision Polymer Engineering (PPE)	75.74	86.48	75.68	94.37	110.91	121.25

Fluorez Technology	84.02	96.23	80.02	101.96	127.10	137.05
Applied Seals	64.43	75.90	65.23	82.73	95.12	107.28
Parco (Datwyler)	45.83	46.74	40.84	47.18	60.37	62.03
Parker Hannifin	18.37	18.65	15.58	17.19	18.35	18.45
CTG	18.31	18.61	16.14	18.25	18.84	19.29
Ningbo Sunshine	18.02	18.87	16.21	18.12	19.03	18.92
Others	207.86	231.64	191.81	222.96	280.83	303.71
Total	1,397.12	1,539.52	1,318.82	1,576.12	1,938.79	2,116.15

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

Table 6. Global Semiconductor FFKM O-ring Sales Share by Companies, 2017-2022

Company	2017	2018	2019	2020	2021	2022
DuPont	13.92%	13.70%	14.60%	14.10%	14.17%	14.58%
Greene Tweed	7.27%	7.20%	7.04%	7.32%	7.35%	7.29%
Trelleborg	6.70%	6.67%	6.57%	6.65%	6.52%	6.37%
Freudenberg	6.66%	6.01%	6.12%	6.19%	5.67%	5.71%
TRP Polymer Solutions	6.02%	6.29%	6.29%	6.53%	6.54%	6.42%
Gapi	7.30%	7.58%	7.53%	7.58%	7.60%	7.45%
Maxmold Polymer	3.98%	3.57%	3.56%	4.02%	3.83%	4.08%
Yoson Seals	10.02%	10.45%	10.28%	9.36%	10.65%	10.88%
Precision Polymer Engineering (PPE)	5.42%	5.62%	5.74%	5.99%	5.72%	5.73%
Fluorez Technology	6.01%	6.25%	6.07%	6.47%	6.56%	6.48%
Applied Seals	4.61%	4.93%	4.95%	5.25%	4.91%	5.07%
Parco (Datwyler)	3.28%	3.04%	3.10%	2.99%	3.11%	2.93%
Parker Hannifin	1.31%	1.21%	1.18%	1.09%	0.95%	0.87%
CTG	1.31%	1.21%	1.22%	1.16%	0.97%	0.91%
Ningbo Sunshine	1.29%	1.23%	1.23%	1.15%	0.98%	0.89%
Others	14.88%	15.05%	14.54%	14.15%	14.48%	14.35%
Total	100%	100%	100%	100%	100%	100%

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

3.5 Global Semiconductor FFKM O-ring Price by Manufacturer (2017-2022)

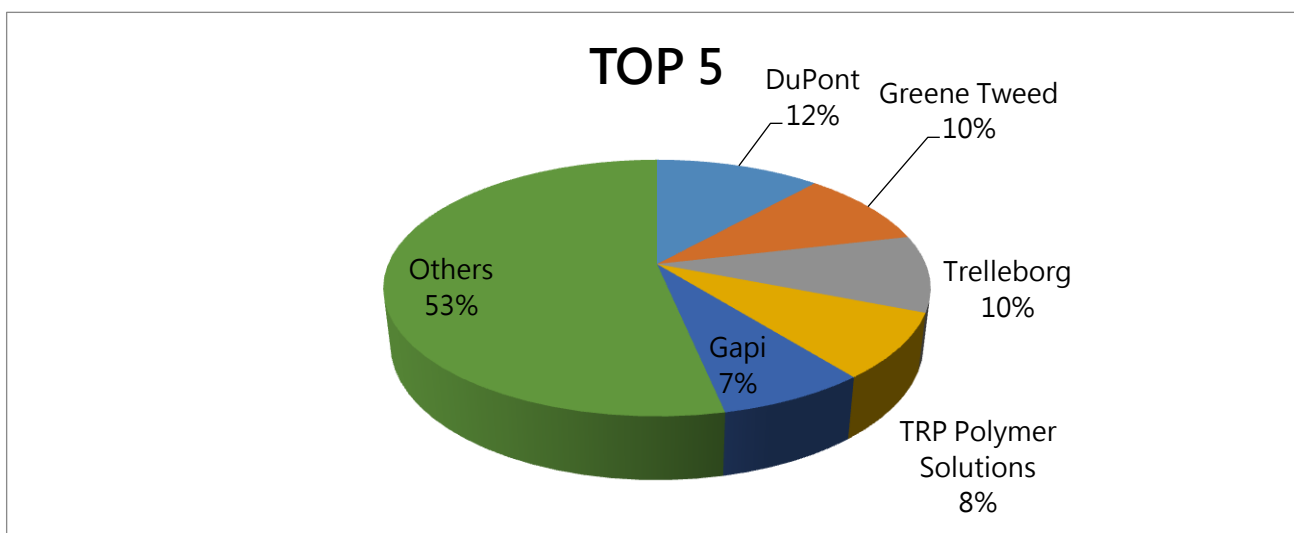
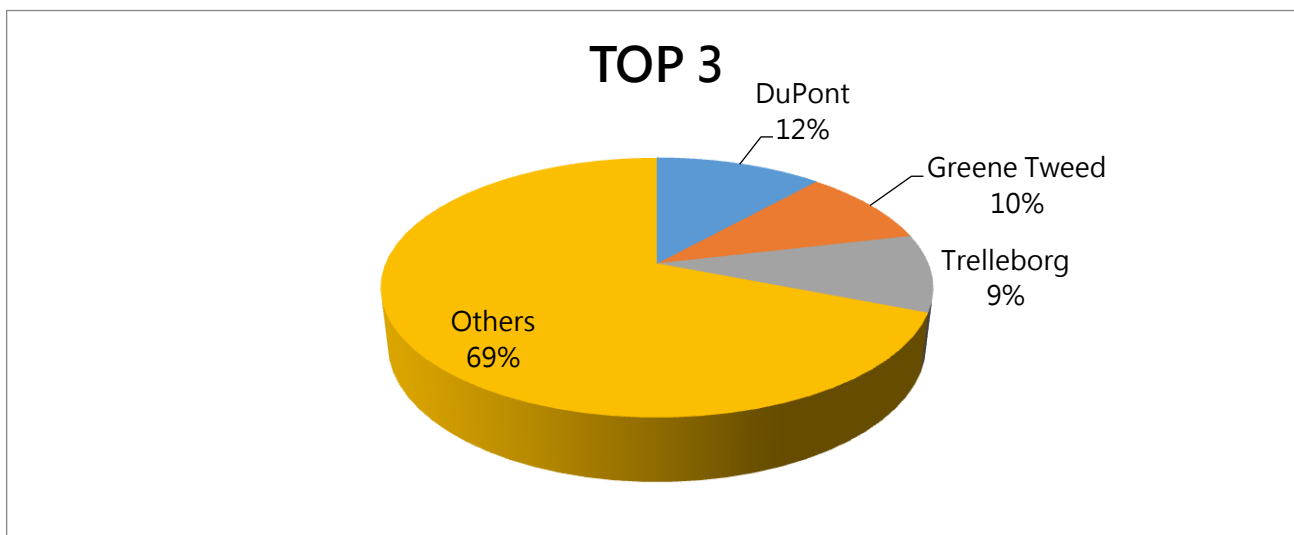
Table 7. Key Manufacturers Semiconductor FFKM O-ring Price (2017-2022) & (US\$/Pcs)

Price (US\$/Pcs)	2017	2018	2019	2020	2021	2022
DuPont	79	77	81	75	80	82
Greene Tweed	131	128	130	126	128	132
Trelleborg	137	136	143	139	144	147
Freudenberg	122	119	121	119	123	130
TRP Polymer Solutions	125	122	126	122	123	128
Gapi	93	91	94	92	95	99
Maxmold Polymer	156	148	156	152	158	165
Yoson Seals	58	55	57	56	59	60
Precision Polymer Engineering (PPE)	91	90	95	91	94	99
Fluorez Technology	70	69	71	71	73	75
Applied Seals	77	75	79	78	80	84
Parco (Datwyler)	113	110	113	108	113	118
Parker Hannifin	135	131	133	130	135	136
CTG	93	89	90	87	91	93
Ningbo Sunshine	55	54	55	53	53	55

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC

3.6 Top 3 and Top 5 Semiconductor FFKM O-ring Companies in Global Market, by Revenue in 2021

Figure 9. The Top 3 and 5 Players Market Share by Semiconductor FFKM O-ring Revenue in 2021



SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC

3.7 Global Manufacturers Semiconductor FFKM O-ring Product Type

The table below details the Semiconductor FFKM O-ring product type of major manufacturers.

Table 8. Global Manufacturers Semiconductor FFKM O-ring Product Type

Company	Product Type
DuPont	High Temperature, Extreme High Temperature
Greene Tweed	High Temperature, Extreme High Temperature
Trelleborg	High Temperature, Extreme High Temperature
Freudenberg	High Temperature, Extreme High Temperature
TRP Polymer Solutions	High Temperature, Extreme High Temperature
Gapi	High Temperature, Extreme High Temperature

Maxmold Polymer	High Temperature, Extreme High Temperature
Yoson Seals	High Temperature
Precision Polymer Engineering (PPE)	High Temperature, Extreme High Temperature
Fluorez Technology	High Temperature, Extreme High Temperature
Applied Seals	High Temperature, Extreme High Temperature
Parco (Datwyler)	High Temperature, Extreme High Temperature
Parker Hannifin	High Temperature, Extreme High Temperature
CTG	High Temperature
Ningbo Sunshine	High Temperature

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC

3.8 Tier 1, Tier 2, and Tier 3 Semiconductor FFKM O-ring Players in Global Market

At present, the Semiconductor FFKM O-ring players have formed a competition form between the first tier and the second tier and the third tier.

Note: the 3 tiers of companies are defined based on their revenue in Semiconductor FFKM O-ring as of 2021. Tier 1=> US\$ 15 million, Tier 2= US\$ 1 million to US\$ 15 million, and Tier 3=< US\$ 1 million.

3.8.1 List of Global Tier 1 Semiconductor FFKM O-ring Companies

Table 9. List of Global Tier 1 Semiconductor FFKM O-ring Companies, Revenue (US\$, Mn) in 2021 and Market Share

Company	Revenue	Market Share
DuPont	21.98	11.66%
Greene Tweed	18.24	9.68%
Trelleborg	18.19	9.65%
TRP Polymer Solutions	15.59	8.27%
Tier 1 Total	74	39.25%

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

3.8.2 List of Global Tier 2 and Tier 3 Semiconductor FFKM O-ring Companies

Table 10. List of Global Tier 2 and Tier 3 Semiconductor FFKM O-ring Companies, Revenue (US\$, Mn) in 2021 and Market Share

Company	Revenue	Market Share
Freudenberg	13.53	7.18%
Gapi	14	7.43%

DuPont	11.72	6.22%
Yoson Seals	12.18	6.46%
Precision Polymer Engineering (PPE)	10.43	5.53%
Fluorez Technology	9.28	4.92%
Applied Seals	7.61	4.04%
Parco (Datwyler)	6.82	3.62%
Parker Hannifin	2.48	1.32%
CTG	1.71	0.91%
Ningbo Sunshine	1.01	0.54%
Others	23.75	12.60%
Tier 2 Total	90.77	48.15%
Tier 3 Total	23.75	12.60%

SOURCE: ABOVE COMPANIES; SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

4 Sights by Product

The Global Semiconductor FFKM O-ring market comprises of the following key product sectors:

High Temperature, $\leq 300^{\circ}\text{C}$

Extreme High Temperature, $> 300^{\circ}\text{C}$

4.1 Overview

4.1.1 by Temperature Range - Global Semiconductor FFKM O-ring Market Size Markets, 2021 & 2028

Table 11. by Temperature Range – Global Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2021 & 2028

BY TYPE	2021 (\$ Mn)	2028 (\$ Mn)	CAGR (22-28)
High Temperature	123.13	216.96	7.83%
Extreme High Temperature	65.39	129.17	9.61%
Total	188.52	346.13	8.47%

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

4.1.2 High Temperature

The following chart illustrates the performance of the High Temperature market since 2017, with forecasts to 2028 at manufacturers selling prices (figures changed for sample purposes):

As illustrated, High Temperature are the dominant product sector in the market. In 2021, High Temperature are estimated to be worth just over 123.13 million at manufacturers selling prices reflecting 65.31% of the total Semiconductor FFKM O-ring market.

4.1.3 Extreme High Temperature

The Extreme High Temperature is the second largest sector of Semiconductor FFKM O-ring market, sales of these products are currently valued at around 34.69% of the market at present, reflecting a value of around 65.39 million in 2021.

4.2 by Temperature Range - Global Semiconductor FFKM O-ring Revenue & Forecasts

4.2.1 by Temperature Range - Global Semiconductor FFKM O-ring Revenue, 2017-2022

Table 12. by Temperature Range - Global Semiconductor FFKM O-ring Revenue (US\$, Mn), 2017-2022

Segment by Temperature Range	2017	2018	2019	2020	2021	2022
High Temperature	90.45	95.58	84.31	94.79	123.13	138.05
Extreme High Temperature	44.71	48.38	43.3	49.24	65.39	74.5
Total	135.16	143.96	127.61	144.03	188.52	212.55

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

4.2.2 by Temperature Range - Global Semiconductor FFKM O-ring Revenue, 2023-2028

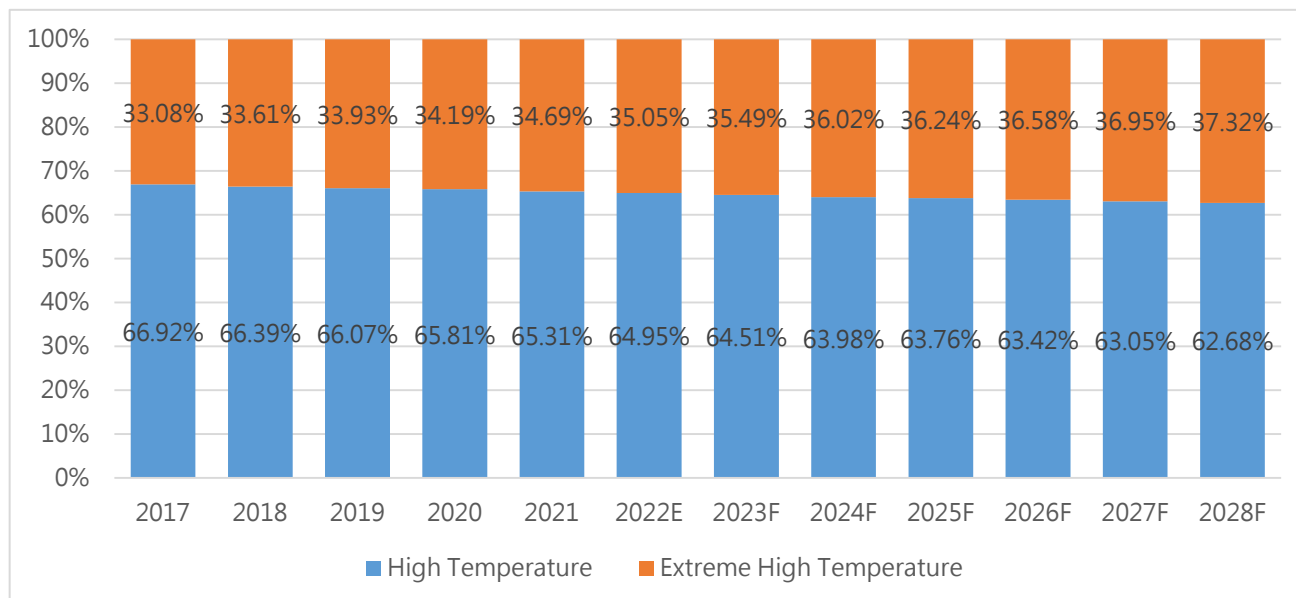
Table 13. by Temperature Range - Global Semiconductor FFKM O-ring Revenue (US\$, Mn), 2023-2028

Segment by Temperature Range	2023	2024	2025	2026	2027	2028
High Temperature	145.56	161.19	162.36	178.97	191.61	216.96
Extreme High Temperature	80.07	90.76	92.3	103.23	112.3	129.17
Total	225.63	251.95	254.66	282.2	303.91	346.13

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

4.2.3 by Temperature Range - Global Semiconductor FFKM O-ring Revenue Market Share, 2017-2028

Figure 10. by Temperature Range - Global Semiconductor FFKM O-ring Revenue Market Share, 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

4.3 by Temperature Range - Global Semiconductor FFKM O-ring Sales & Forecasts

4.3.1 by Temperature Range - Global Semiconductor FFKM O-ring Sales, 2017-2022

Table 14. by Temperature Range - Global Semiconductor FFKM O-ring Sales (K Pcs), 2017-2022

Segment by Temperature Range	2017	2018	2019	2020	2021	2022
High Temperature	978.01	1,070.76	913.46	1,088.12	1,329.42	1,444.11
Extreme High Temperature	419.11	468.76	405.36	488	609.37	672.04
Total	1,397.12	1,539.52	1,318.82	1,576.12	1,938.79	2,116.15

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

4.3.2 by Temperature Range - Global Semiconductor FFKM O-ring Sales, 2023-2028

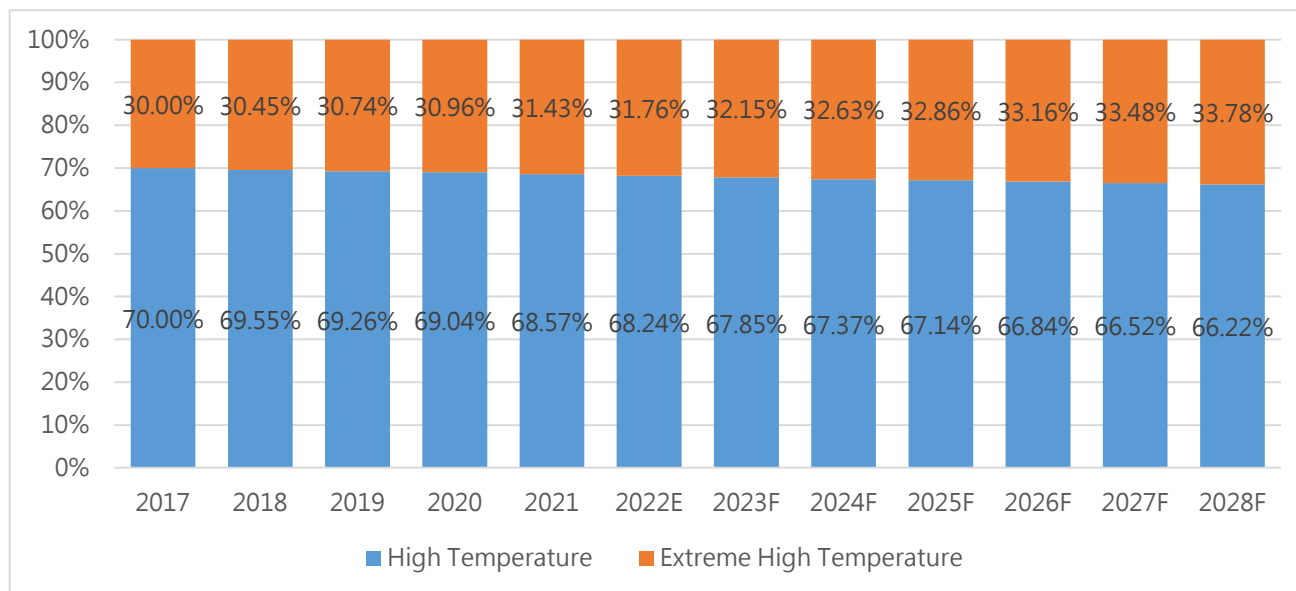
Table 15. by Temperature Range - Global Semiconductor FFKM O-ring Sales (K Pcs), 2023-2028

Segment by Temperature Range	2023	2024	2025	2026	2027	2028
High Temperature	1,560.89	1,668.12	1,783.06	1,918.35	2,101.60	2,293.77
Extreme High Temperature	739.73	807.91	872.62	951.81	1,057.97	1,170.07
Total	2,300.62	2,476.03	2,655.68	2,870.16	3,159.57	3,463.84

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

4.3.3 by Temperature Range - Global Semiconductor FFKM O-ring Sales Market Share, 2017-2028

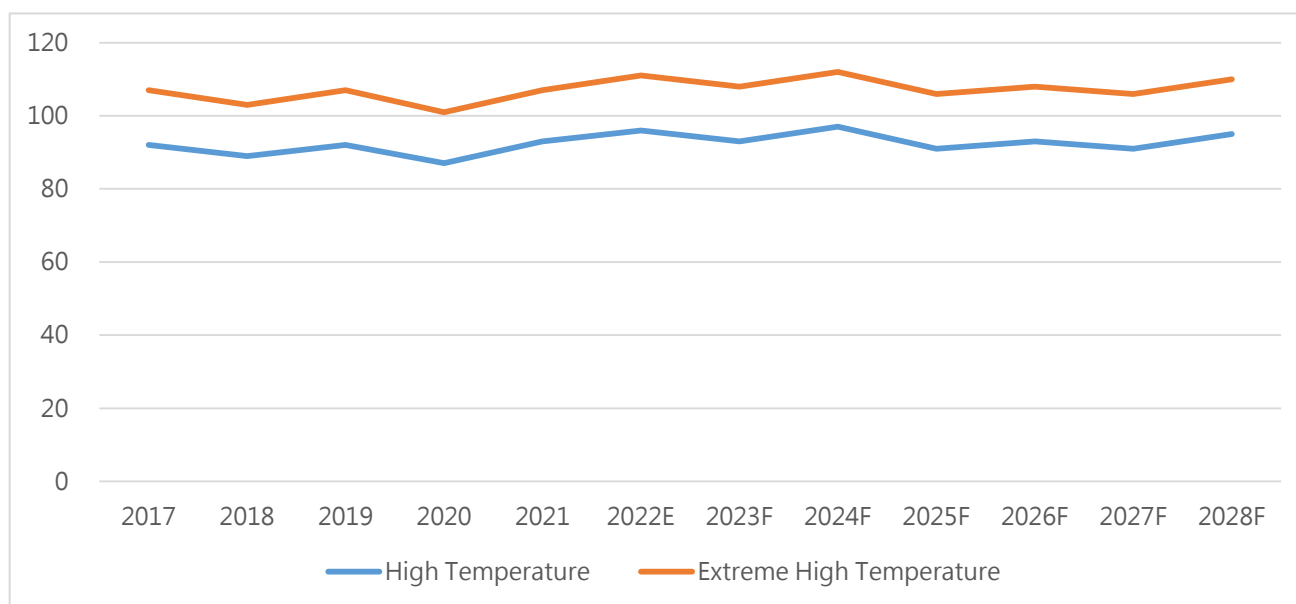
Figure 11. by Temperature Range - Global Semiconductor FFKM O-ring Sales Market Share, 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

4.4 by Temperature Range - Global Semiconductor FFKM O-ring Price (Manufacturers Selling Prices), 2017-2028

Figure 12. by Temperature Range - Global Semiconductor FFKM O-ring Price (US\$/Pcs), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5 Sights by Application

5.1 Overview

5.1.1 by Application - Global Semiconductor FFKM O-ring Market Size, 2021 & 2028

Table 16. by Application – Global Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2021 & 2028

by Application	2021 (\$ Mn)	2028 (\$ Mn)	CAGR (22-28)
Plasma Process	74.38	128.06	7.54%
Thermal Process	77.69	151.42	9.35%
Wet Chemical Process	28.45	51.73	8.24%
Others	8	14.92	8.69%
Total	188.52	346.13	8.47%

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5.1.2 Plasma Process

Plasma processing refers to any microfabrication process that uses a plasma discharge to achieve the process results. There are deposition processes like PECVD and sputtering, etching processes (RIE), cleaning, and surface activation to name a few.

5.1.3 Thermal Process

The term ‘thermal process’ covers a broad scope of installations. These installation temperatures are usually higher than Plasma Processes and can go up to +300°C. In addition, thermal-based installations require not only sealing materials with a particular chemical resistance demands but also ones with good mechanical features and low compression set.

Thermal Processes include:

Atomic Layer Deposition (ALD)

Low-Pressure Chemical Vapour Deposition (LPCVD)

Sub Atmospheric Chemical Vapour Deposition (SACVD)

Rapid Thermal Processing (RTP)

Metal Chemical Vapour Deposition

Oxidation

Annealing

5.1.4 Wet Chemical Process

Wet chemical process is used for a variety of purposes, from chemical removal of material (wet etching) to deposition of material (electroplating), to sample cleaning, to the creation of patterns on the surface using optical lithography techniques. Many chemicals and materials can be handled in the LNF.

5.1.5 Others

Semiconductor FFKM O-ring used in some vacuum equipment etc.

5.2 by Application - Global Semiconductor FFKM O-ring Revenue & Forecasts

5.2.1 by Application - Global Semiconductor FFKM O-ring Revenue, 2017-2022

Table 17. by Application - Global Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2022

Segment by Application	2017	2018	2019	2020	2021	2022
Plasma Process	55.92	58.97	51.62	57.58	74.38	82.78
Thermal Process	53.09	57.11	51.28	58.61	77.69	88.56
Wet Chemical Process	20.46	21.73	19.28	21.71	28.45	32.16
Others	5.69	6.15	5.43	6.13	8	9.05
Total	135.16	143.96	127.61	144.03	188.52	212.55

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5.2.2 by Application - Global Semiconductor FFKM O-ring Revenue, 2023-2028

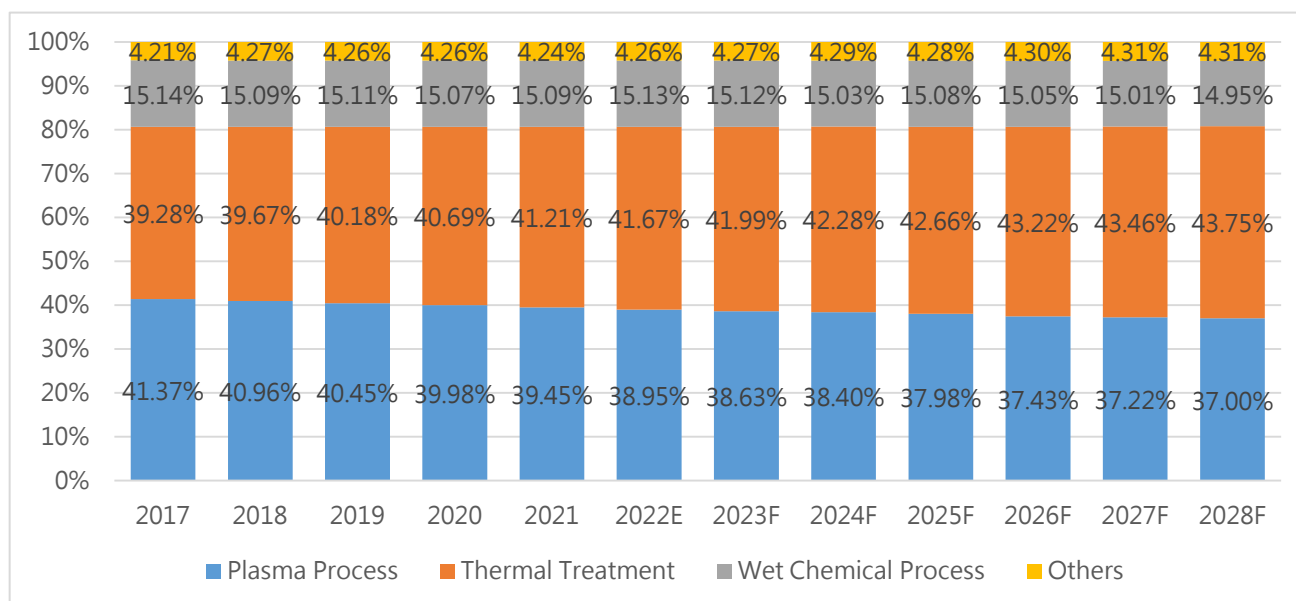
Table 18. by Application - Global Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2023-2028

Segment by Application	2023	2024	2025	2026	2027	2028
Plasma Process	87.15	96.75	96.71	105.62	113.12	128.06
Thermal Process	94.74	106.53	108.65	121.97	132.08	151.42
Wet Chemical Process	34.11	37.86	38.41	42.47	45.62	51.73
Others	9.63	10.81	10.89	12.14	13.09	14.92
Total	225.63	251.95	254.66	282.2	303.91	346.13

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5.2.3 by Application - Global Semiconductor FFKM O-ring Revenue Market Share, 2017-2028

Figure 13. by Application - Global Semiconductor FFKM O-ring Revenue Market Share, 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5.3 by Application - Global Semiconductor FFKM O-ring Sales & Forecasts

5.3.1 by Application - Global Semiconductor FFKM O-ring Sales, 2017-2022

Table 19. by Application - Global Semiconductor FFKM O-ring Sales, (K Pcs), 2017-2022

Segment by Application	2017	2018	2019	2020	2021	2022
Plasma Process	576.53	628.88	532.2	629.16	764.48	823.64
Thermal Process	523.99	583.16	506.05	612.31	762.77	842.19
Wet Chemical Process	213.29	235.05	201.53	240.23	295.85	323.63
Others	83.31	92.43	79.04	94.42	115.69	126.69
Total	1,397.12	1,539.52	1,318.82	1,576.12	1,938.79	2,116.15

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5.3.2 by Application - Global Semiconductor FFKM O-ring Sales, 2023-2028

Table 20. by Application - Global Semiconductor FFKM O-ring Sales, (K Pcs), 2023-2028

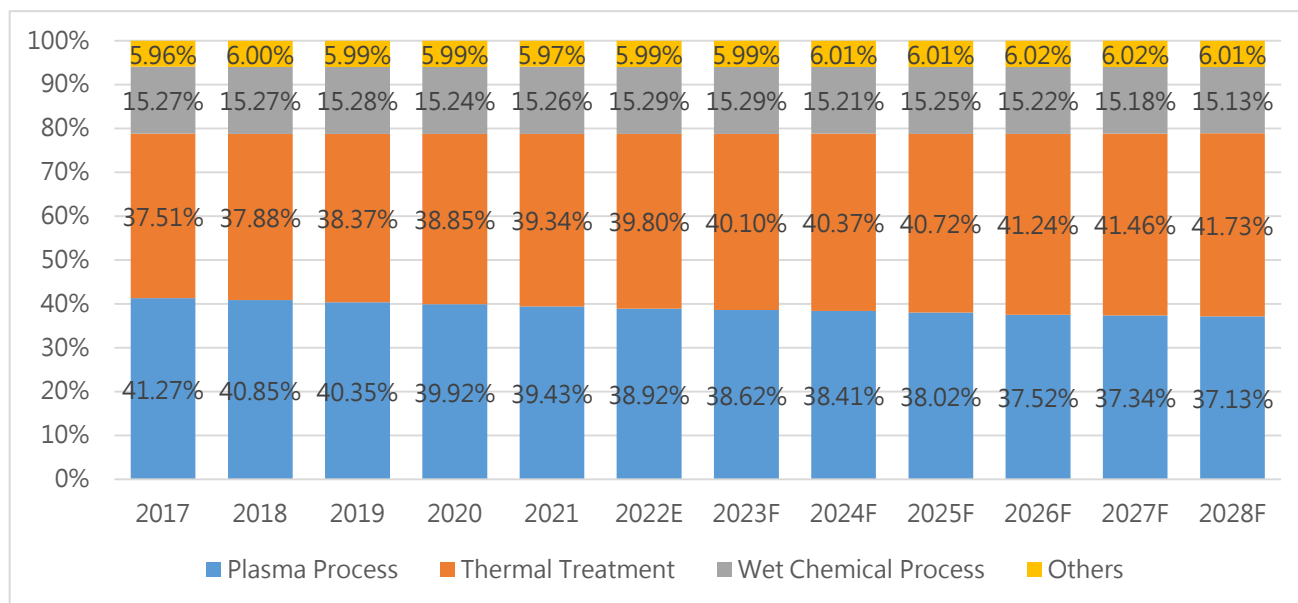
Segment by Application	2023	2024	2025	2026	2027	2028
Plasma Process	888.43	951.12	1,009.79	1,076.79	1,179.66	1,286.00
Thermal Process	922.64	999.63	1,081.34	1,183.79	1,309.98	1,445.52

Wet Chemical Process	351.7	376.49	404.98	436.8	479.73	524.14
Others	137.85	148.79	159.57	172.78	190.2	208.18
Total	2,300.62	2,476.03	2,655.68	2,870.16	3,159.57	3,463.84

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5.3.3 by Application - Global Semiconductor FFKM O-ring Sales Market Share, 2017-2028

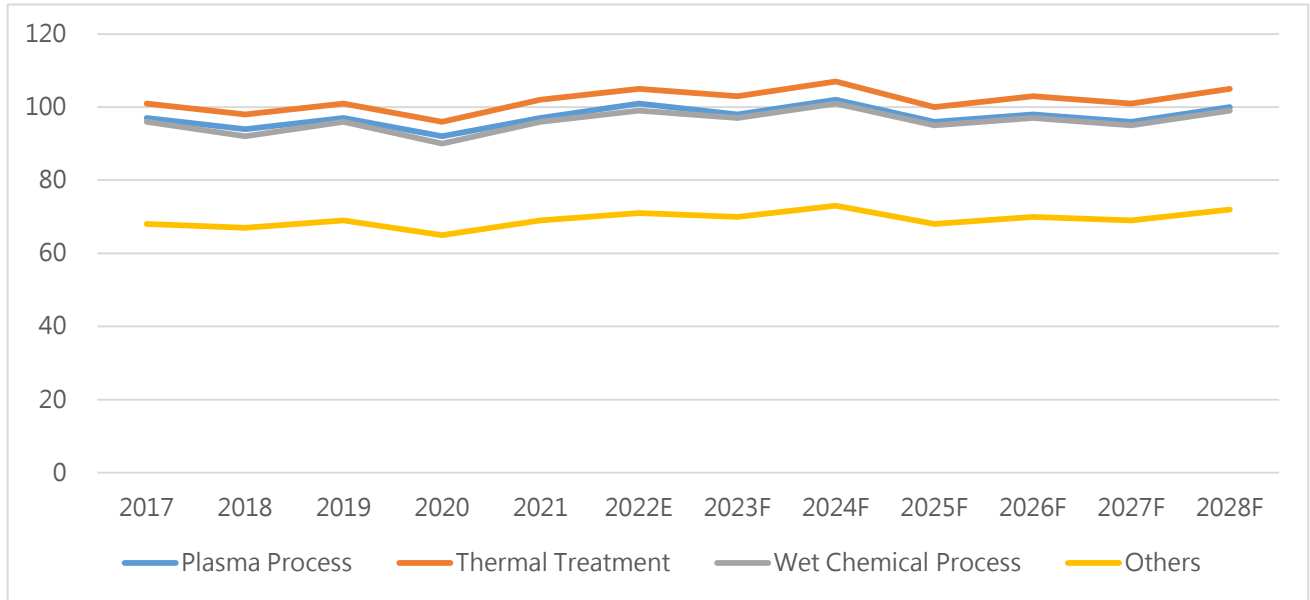
Figure 14. by Application - Global Semiconductor FFKM O-ring Sales Market Share, 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

5.4 by Application - Global Semiconductor FFKM O-ring Price (Manufacturers Selling Prices), 2017-2028

Figure 15. by Application -Global Semiconductor FFKM O-ring Price (US\$/Pcs), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6 Sights by Region

6.1 By Region - Global Semiconductor FFKM O-ring Market Size, 2021 & 2028

Table 21. By Region – Global Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2021-2028

By Region	2021 (\$ Mn)	2028 (\$ Mn)	CAGR (22-28)
North America	62.29	125.87	10.16%
Europe	20.04	36.03	8.11%
Asia	103.47	179.4	7.47%
South America	1.69	3.08	8.48%
Middle East & Africa	1.03	1.75	6.79%
Total	188.52	346.13	8.47%

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.2 By Region - Global Semiconductor FFKM O-ring Revenue & Forecasts

6.2.1 By Region - Global Semiconductor FFKM O-ring Revenue, 2017-2022

Table 22. By Region - Global Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2022

Segment by Region	2017	2018	2019	2020	2021	2022
North America	42.23	47.34	42.11	47.51	62.29	70.45
Europe	14.67	15.68	13.79	15.21	20.04	22.57
Asia	76.34	78.87	69.88	79.24	103.47	116.46
South America	1.19	1.27	1.13	1.3	1.69	1.89
Middle East & Africa	0.73	0.8	0.7	0.77	1.03	1.18
Total	135.16	143.96	127.61	144.03	188.52	212.55

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.2.2 By Region - Global Semiconductor FFKM O-ring Revenue, 2023-2028

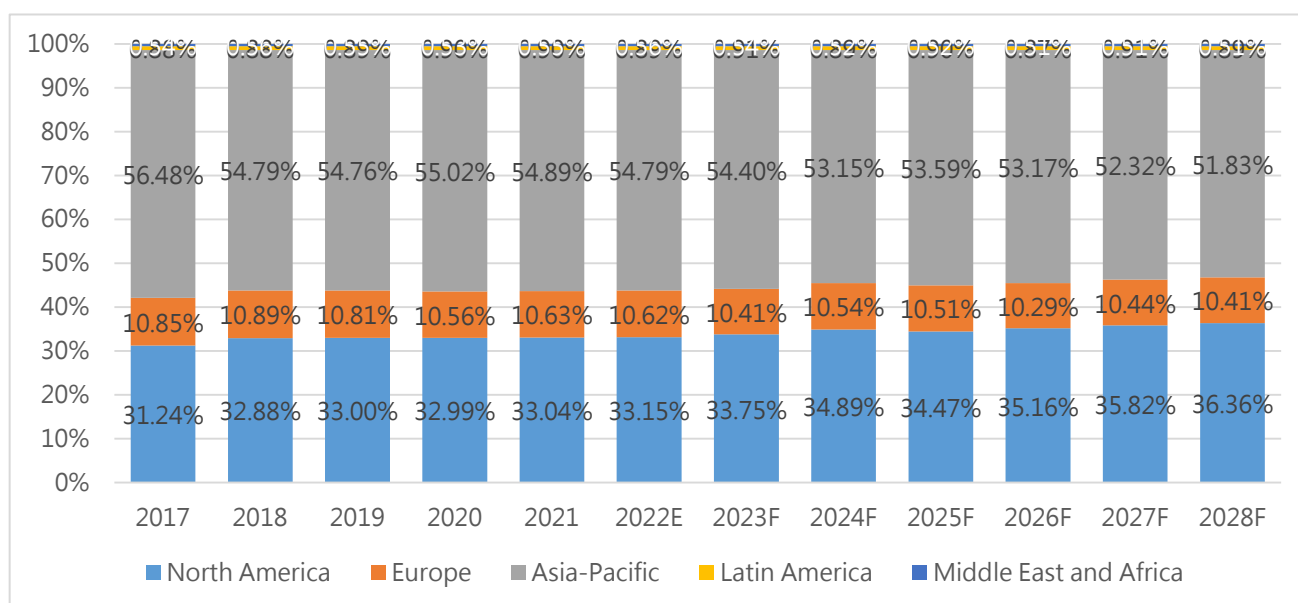
Table 23. By Region - Global Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2023-2028

Segment by Region	2023	2024	2025	2026	2027	2028
North America	76.14	87.9	87.79	99.21	108.85	125.87
Europe	23.48	26.56	26.77	29.05	31.74	36.03
Asia	122.74	133.92	136.47	150.04	159.01	179.4
South America	2.06	2.25	2.3	2.46	2.76	3.08
Middle East & Africa	1.21	1.32	1.33	1.44	1.55	1.75
Total	225.63	251.95	254.66	282.2	303.91	346.13

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.2.3 By Region - Global Semiconductor FFKM O-ring Revenue Market Share, 2017-2028

Figure 16. By Region - Global Semiconductor FFKM O-ring Revenue Market Share, 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.3 By Region - Global Semiconductor FFKM O-ring Sales & Forecasts

6.3.1 By Region - Global Semiconductor FFKM O-ring Sales, 2017-2022

Table 24. By Region - Global Semiconductor FFKM O-ring Sales, (K Pcs), 2017-2022

Segment by Region	2017	2018	2019	2020	2021	2022
North America	393.3	449.2	386.61	459.94	569.41	629.26
Europe	139.43	153.73	129.53	153.73	189.01	204.79
Asia	842.32	912.02	781.71	937.09	1,149.14	1,248.09

South America	13.55	15.22	13.04	15.76	19.4	21.17
Middle East & Africa	8.52	9.35	7.93	9.6	11.83	12.84
Total	1,397.12	1,539.52	1,318.82	1,576.12	1,938.79	2,116.15

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.3.2 By Region - Global Semiconductor FFKM O-ring Sales, 2023-2028

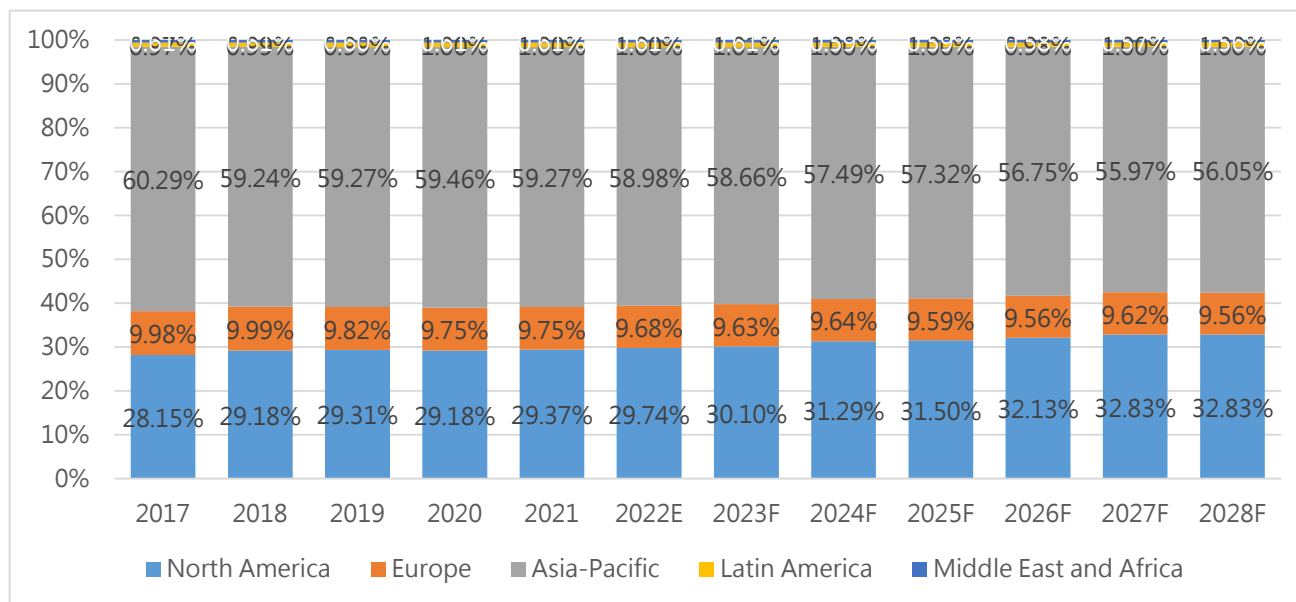
Table 25. By Region - Global Semiconductor FFKM O-ring Sales, (K Pcs), 2023-2028

Segment by Region	2023	2024	2025	2026	2027	2028
North America	692.47	774.64	836.51	922.22	1,037.22	1,137.07
Europe	221.51	238.77	254.81	274.34	304.06	331.2
Asia	1,349.54	1,423.36	1,522.36	1,628.76	1,768.56	1,941.41
South America	23.15	24.65	26.45	28.22	31.67	34.63
Middle East & Africa	13.95	14.61	15.55	16.62	18.06	19.53
Total	2,300.62	2,476.03	2,655.68	2,870.16	3,159.57	3,463.84

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.3.3 By Region - Global Semiconductor FFKM O-ring Sales Market Share, 2017-2028

Figure 17. By Region - Global Semiconductor FFKM O-ring Sales Market Share, 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.4 North America

6.4.1 By Country - North America Semiconductor FFKM O-ring Revenue, 2017-2028

Table 26. By Country - North America Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2022

North America	2017	2018	2019	2020	2021	2022
U.S.	40.73	45.8	40.74	46	60.32	68.19
Canada	1.5	1.54	1.37	1.51	1.97	2.26
Total	42.23	47.34	42.11	47.51	62.29	70.45

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

Table 27. By Country - North America Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2023-2028

North America	2023	2024	2025	2026	2027	2028
U.S.	73.75	85.25	85.05	96.17	105.68	122.22
Canada	2.39	2.65	2.74	3.04	3.17	3.65
Total	76.14	87.9	87.79	99.21	108.85	125.87

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.4.2 By Country - North America Semiconductor FFKM O-ring Sales, 2017-2028

Table 28. By Country - North America Semiconductor FFKM O-ring Sales, (K Pcs), 2017-2022

North America	2017	2018	2019	2020	2021	2022
United States	379.19	434.09	374.06	444.96	550.68	609.11
Canada	14.11	15.11	12.55	14.98	18.73	20.15
Total	393.3	449.2	386.61	459.94	569.41	629.26

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

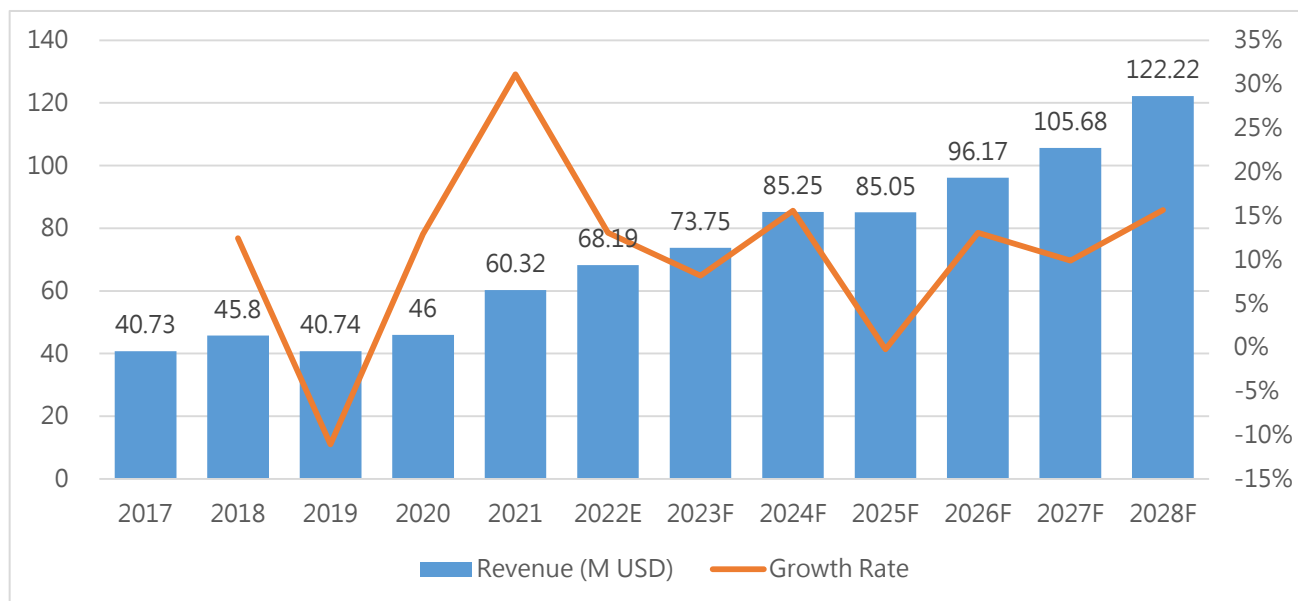
Table 29. By Country - North America Semiconductor FFKM O-ring Sales, (K Pcs), 2023-2028

North America	2023	2024	2025	2026	2027	2028
United States	670.16	750.8	811.18	894.55	1,006.46	1,103.57
Canada	22.31	23.84	25.33	27.67	30.76	33.5
Total	692.47	774.64	836.51	922.22	1,037.22	1,137.07

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.4.3 United States Semiconductor FFKM O-ring Market Size, 2017-2028

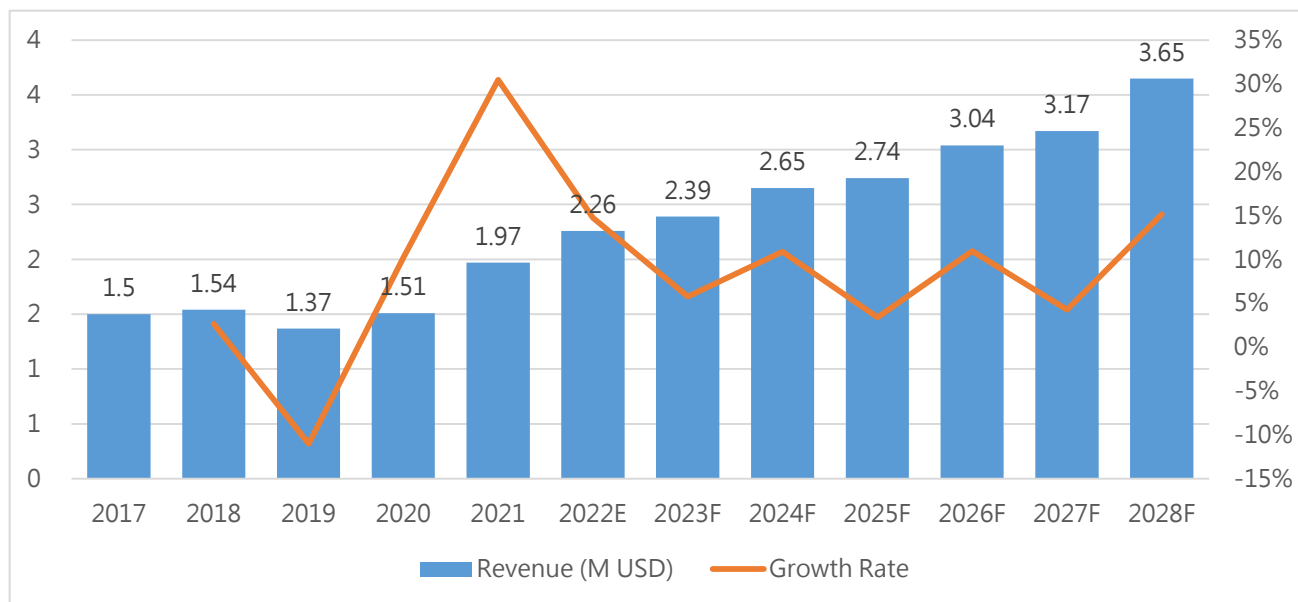
Figure 18. United States Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.4.4 Canada Semiconductor FFKM O-ring Market Size, 2017-2028

Figure 19. Canada Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.5 Europe

6.5.1 By Country - Europe Semiconductor FFKM O-ring Revenue, 2017-2028

Table 30. By Country - Europe Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2022

Europe	2017	2018	2019	2020	2021	2022
Germany	3.98	4.38	3.84	4.25	5.5	6.17
France	3.07	3.2	2.86	3.14	4.24	4.68
U.K.	1.77	1.87	1.69	1.84	2.45	2.73
Italy	2.32	2.43	2.18	2.43	3.22	3.69
Netherlands	2.19	2.32	1.95	2.18	2.88	3.26
Rest of Europe	1.34	1.48	1.27	1.37	1.75	2.04
Total	14.67	15.68	13.79	15.21	20.04	22.57

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

Table 31. By Country - Europe Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2023-2028

Europe	2023	2024	2025	2026	2027	2028
Germany	6.47	7.09	7.1	7.75	8.68	9.66
France	4.91	5.36	5.56	5.98	6.32	7.19
U.K.	2.83	3.31	3.31	3.58	3.8	4.39
Italy	3.88	4.56	4.54	4.95	5.37	6.24
Netherlands	3.3	3.93	3.88	4.14	4.66	5.34
Rest of Europe	2.09	2.31	2.38	2.65	2.91	3.21
Total	23.48	26.56	26.77	29.05	31.74	36.03

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.5.2 By Country - Europe Semiconductor FFKM O-ring Sales, 2017-2028

Table 32. By Country - Europe Semiconductor FFKM O-ring Sales, (K Pcs), 2017-2022

Europe	2017	2018	2019	2020	2021	2022
Germany	37.16	41.34	35.6	42.09	51.4	54.63
France	29.2	31.73	26.26	31.71	39.23	42.52
U.K.	16.35	18.33	15.69	18.58	23.15	25.05
Italy	21.93	24.06	20.33	24.52	30.12	33.26
Netherlands	20.68	22.52	18.56	21.6	26.87	29.36
Rest of Europe	14.11	15.75	13.09	15.23	18.24	19.97
Total	139.43	153.73	129.53	153.73	189.01	204.79

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

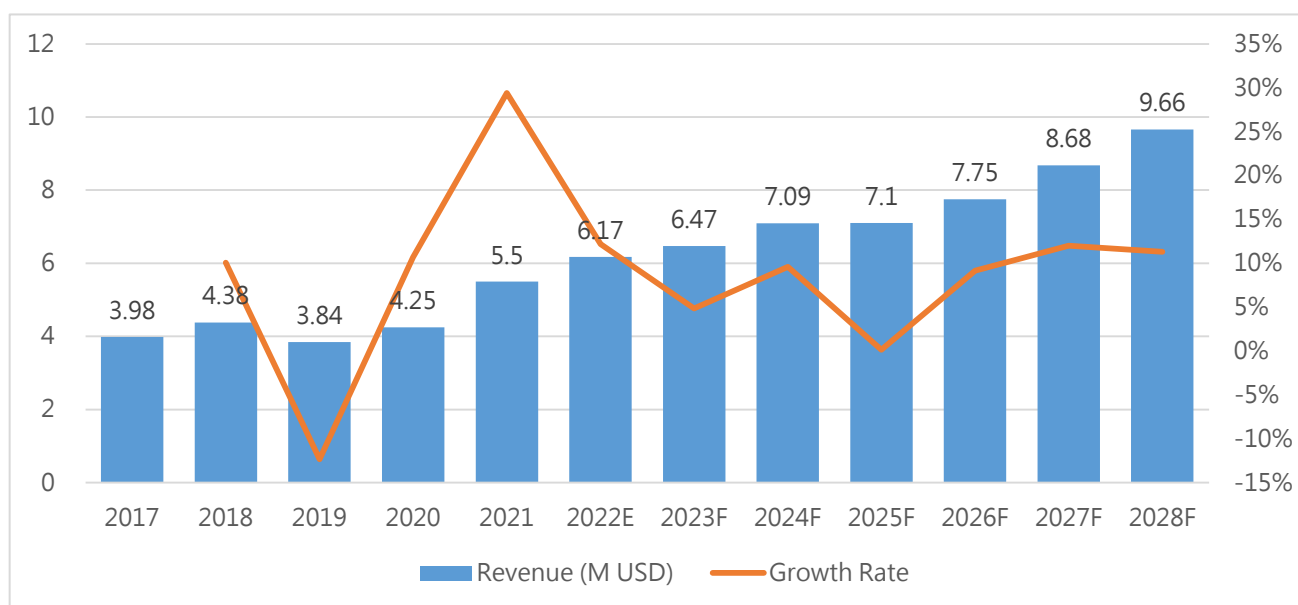
Table 33. By Country - Europe Semiconductor FFKM O-ring Sales, (K Pcs), 2023-2028

Europe	2023	2024	2025	2026	2027	2028
Germany	59.88	64.45	68.27	73.77	82.67	89.49
France	45.48	48.29	51.98	55.39	61.35	65.33
U.K.	26.7	29.07	31.25	32.8	35.51	39.2
Italy	36.29	39.66	42.46	46.7	51.65	57.25
Netherlands	31.4	34.43	36.29	38.68	43.15	48.1
Rest of Europe	21.76	22.87	24.56	27	29.73	31.83
Total	221.51	238.77	254.81	274.34	304.06	331.2

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.5.3 Germany Semiconductor FFKM O-ring Market Size, 2017-2028

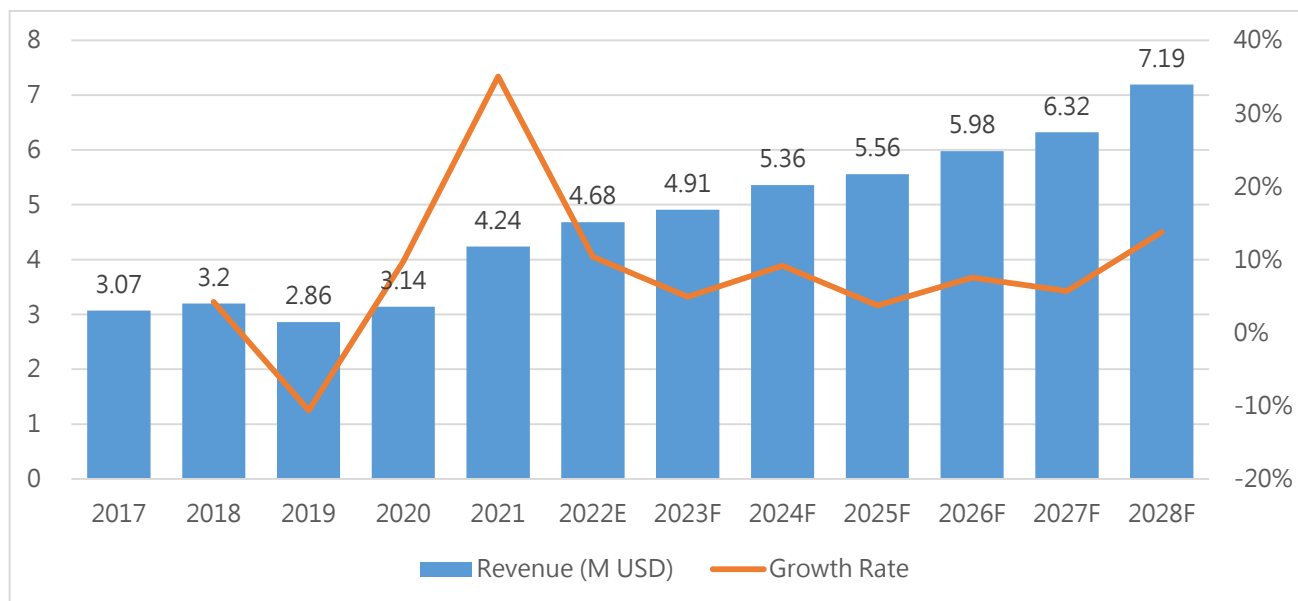
Figure 20. Germany Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.5.4 France Semiconductor FFKM O-ring Market Size, 2017-2028

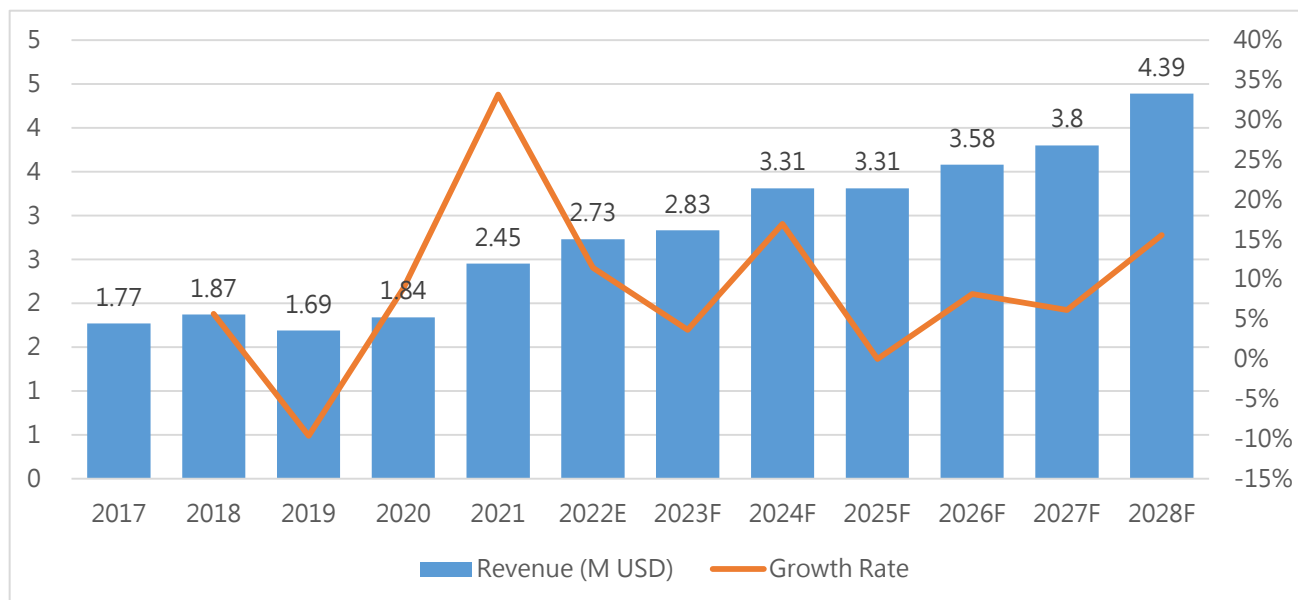
Figure 21. France Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.5.5 U.K. Semiconductor FFKM O-ring Market Size, 2017-2028

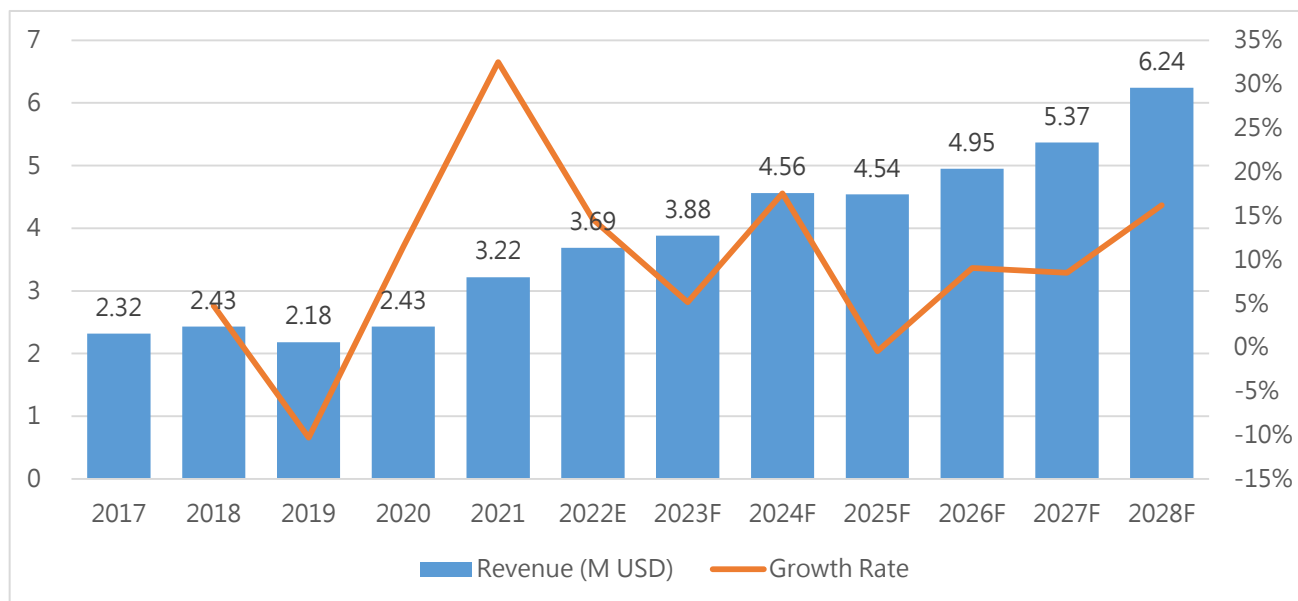
Figure 22. U.K. Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.5.6 Italy Semiconductor FFKM O-ring Market Size, 2017-2028

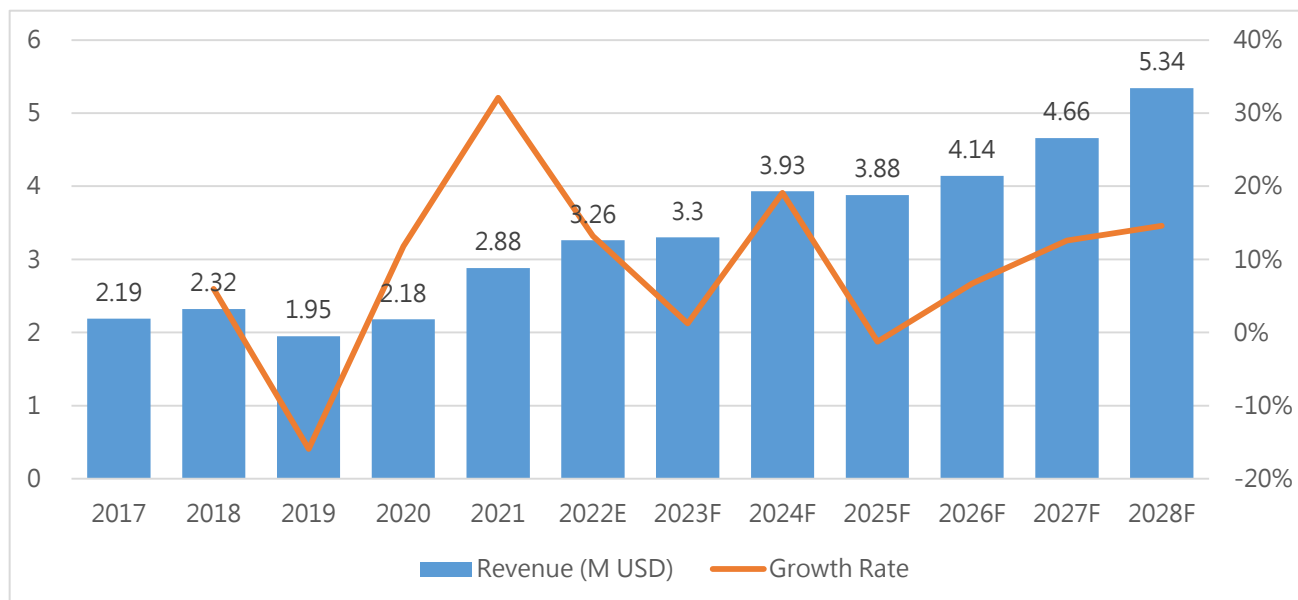
Figure 23. Italy Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.5.7 Netherlands Semiconductor FFKM O-ring Market Size, 2017-2028

Figure 24. Netherlands Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6 Asia

6.6.1 By Region - Asia Semiconductor FFKM O-ring Revenue, 2017-2028

Table 34. By Region - Asia Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2022

Asia	2017	2018	2019	2020	2021	2022
China Mainland	14.35	14.55	12.89	14.89	19.65	20.99
Taiwan	22.1	22.84	20.74	22.43	30.19	34.63
Japan	16.72	16.94	15.27	17.71	22.34	25.38
South Korea	13	13.93	11.81	13.95	17.77	19.86
Southeast Asia	7.36	7.53	6.46	7.35	9.67	11.33
India	1.58	1.73	1.56	1.6	2.18	2.42
Rest of Asia	1.23	1.35	1.15	1.31	1.67	1.85
Total	76.34	78.87	69.88	79.24	103.47	116.46

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

Table 35. By Region - Asia Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2023-2028

Asia	2023	2024	2025	2026	2027	2028
China Mainland	23.4	25.08	24.24	26	29.09	32.43
Taiwan	36.04	39.23	41.48	45.81	47.73	54.11
Japan	25.6	28.22	29.93	32.78	34.47	39.4
South Korea	21.41	23.4	22.47	25.97	26.74	29.98
Southeast Asia	11.74	13.02	13.22	13.84	15.06	16.7
India	2.54	2.82	2.83	3.16	3.27	3.72
Rest of Asia	2.01	2.15	2.3	2.48	2.65	3.06
Total	122.74	133.92	136.47	150.04	159.01	179.4

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6.2 By Region - Asia Semiconductor FFKM O-ring Sales, 2017-2028

Table 36. By Region - Asia Semiconductor FFKM O-ring Sales, (K Pcs), 2017-2022

Asia	2017	2018	2019	2020	2021	2022
China Mainland	159.41	173.2	148.12	177.3	220.81	235.85
Taiwan	237.65	253.83	220.68	267.07	328.1	360.75
Japan	179.81	194.77	169.68	201.27	240.18	261.65
South Korea	151.17	163.88	137.33	166.03	206.64	220.65
Southeast Asia	82.71	91.79	75.97	90.68	111.16	123.17

India	17.32	19.04	16.41	19.1	23.23	25.48
Rest of Asia	14.25	15.51	13.52	15.64	19.02	20.54
Total	842.32	912.02	781.71	937.09	1,149.14	1,248.09

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

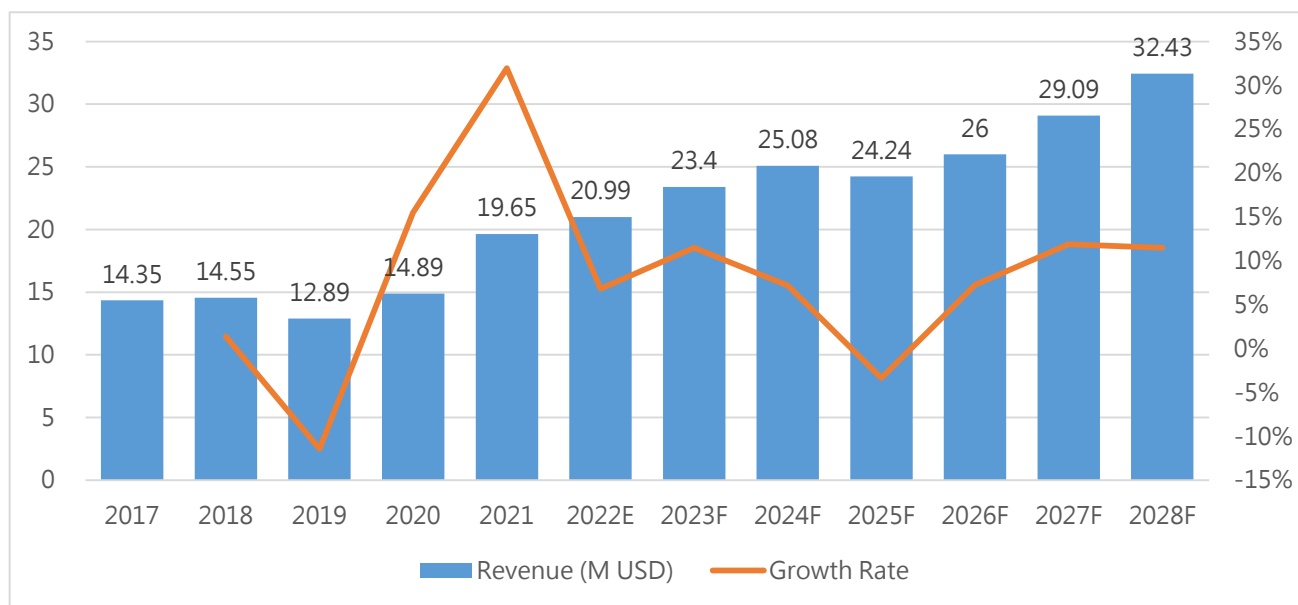
Table 37. By Region - Asia Semiconductor FFKM O-ring Sales, (K Pcs), 2023-2028

Asia	2023	2024	2025	2026	2027	2028
China Mainland	257.1	272.63	285.23	302.37	334.36	360.37
Taiwan	391.7	408.66	441.27	477.19	524.53	581.86
Japan	284.39	300.2	321.81	345.01	370.61	410.41
South Korea	235.26	248.93	267.53	285.43	303.84	329.48
Southeast Asia	131.95	140.01	150.23	157.26	169.18	187.65
India	27.01	29.06	30.48	33.3	35.53	38.7
Rest of Asia	22.13	23.87	25.81	28.2	30.51	32.94
Total	1,349.54	1,423.36	1,522.36	1,628.76	1,768.56	1,941.41

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6.3 China Mainland Semiconductor FFKM O-ring Market Size, 2017-2028

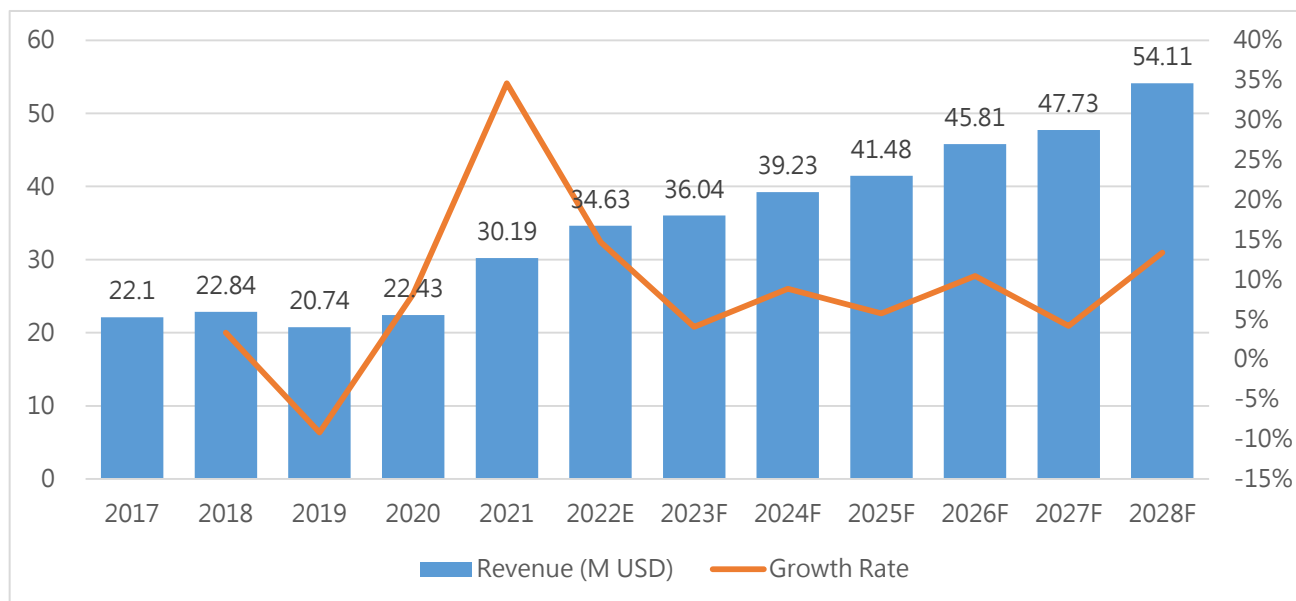
Figure 25. China Mainland Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6.4 Taiwan Semiconductor FFKM O-ring Market Size, 2017-2028

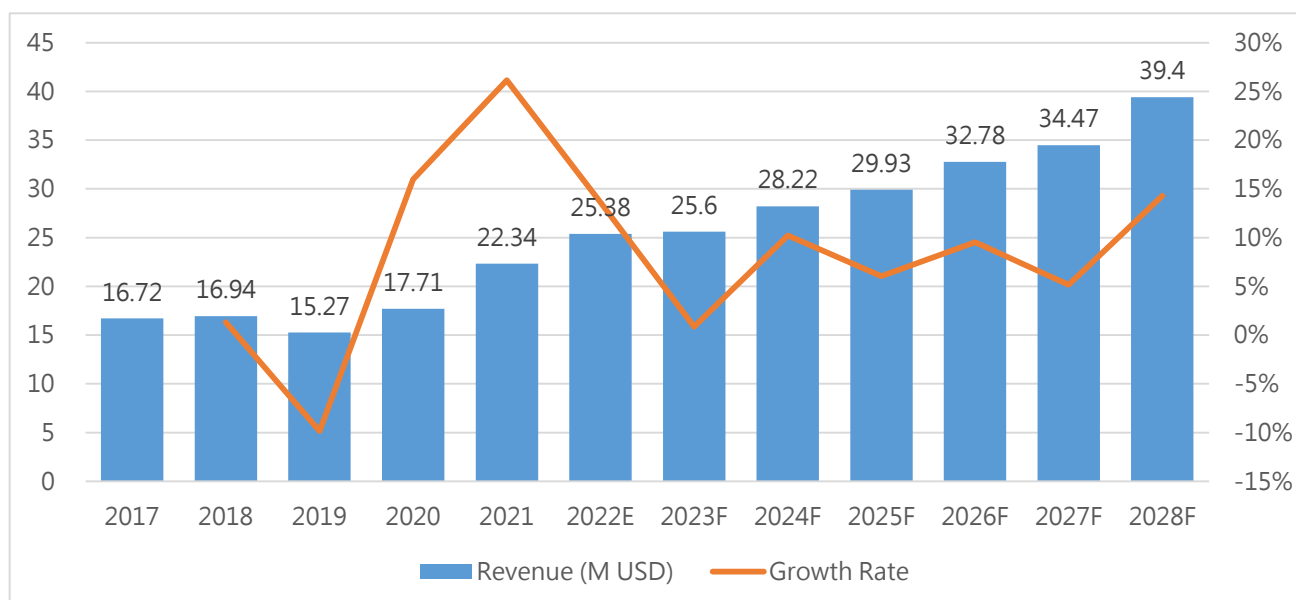
Figure 26. China Taiwan Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6.5 Japan Semiconductor FFKM O-ring Market Size, 2017-2028

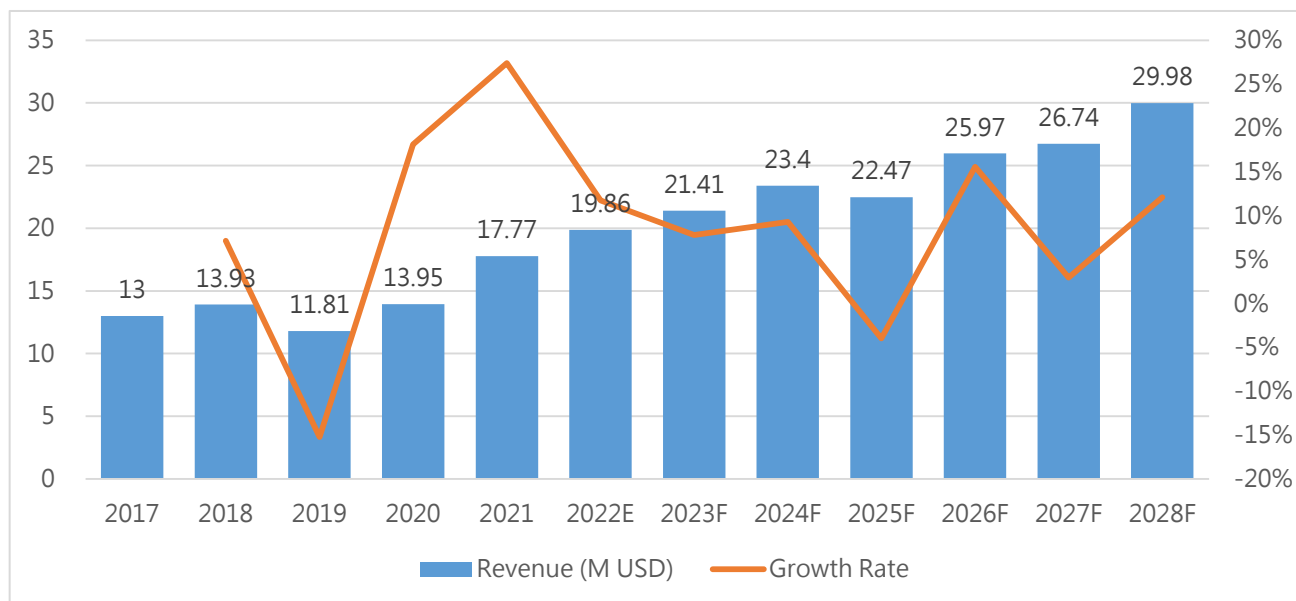
Figure 27. Japan Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6.6 South Korea Semiconductor FFKM O-ring Market Size, 2017-2028

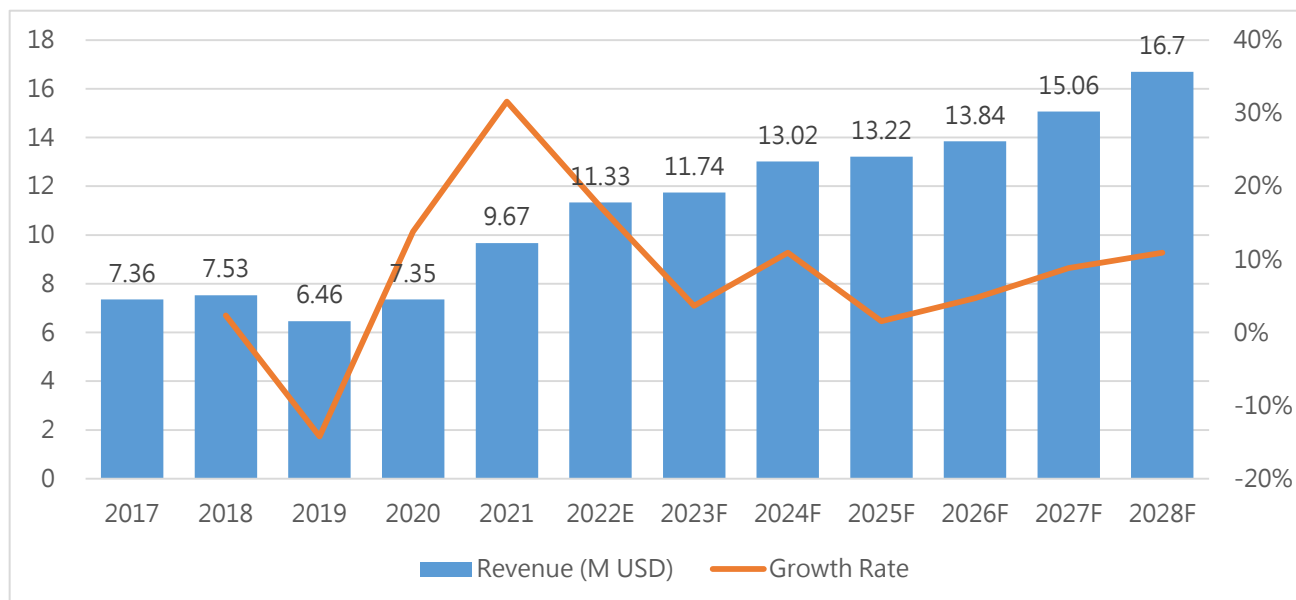
Figure 28. South Korea Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6.7 Southeast Asia Semiconductor FFKM O-ring Market Size, 2017-2028

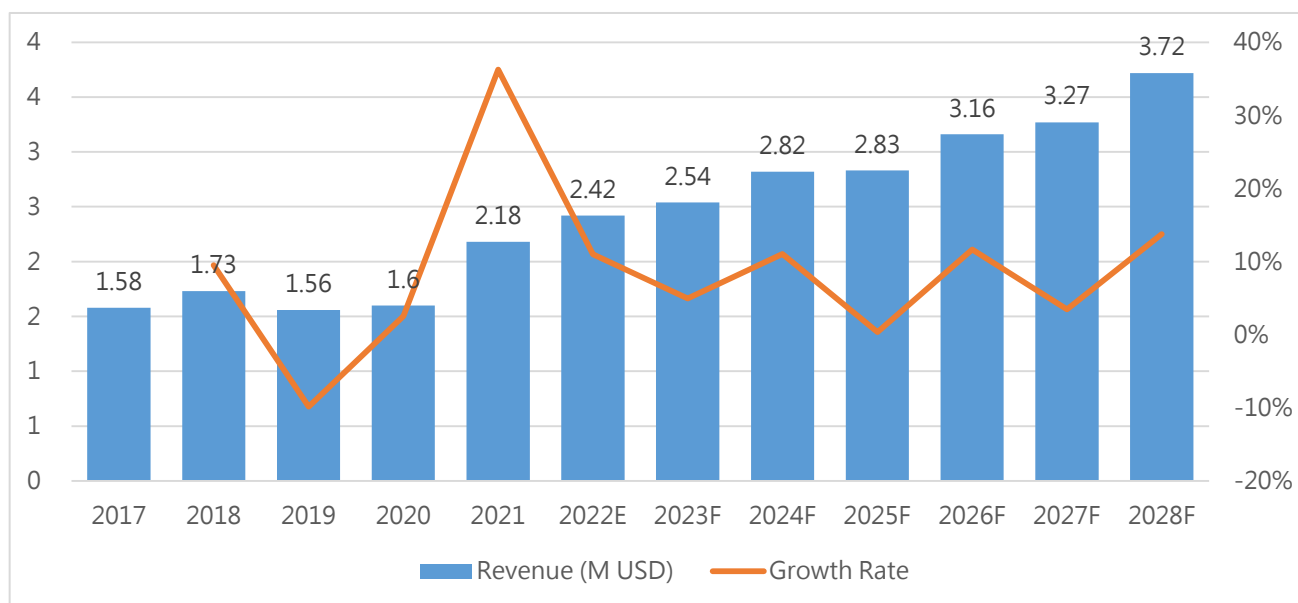
Figure 29. Southeast Asia Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.6.8 India Semiconductor FFKM O-ring Market Size, 2017-2028

Figure 30. India Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.7 South America

6.7.1 By Country - South America Semiconductor FFKM O-ring Revenue, 2017-2028

Table 38. By Country - South America Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2022

South America	2017	2018	2019	2020	2021	2022
Mexico	0.42	0.47	0.39	0.44	0.59	0.65
Brazil	0.51	0.53	0.49	0.57	0.73	0.82
Rest of South America	0.26	0.27	0.25	0.29	0.37	0.42
Total	1.19	1.27	1.13	1.3	1.69	1.89

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

Table 39. By Country - South America Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2023-2028

South America	2023	2024	2025	2026	2027	2028
Mexico	0.69	0.77	0.78	0.84	0.92	1.07
Brazil	0.91	0.98	1.01	1.08	1.24	1.34
Rest of South America	0.46	0.5	0.51	0.54	0.6	0.67
Total	2.06	2.25	2.3	2.46	2.76	3.08

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.7.2 By Country - South America Semiconductor FFKM O-ring Sales, 2017-2028

Table 40. By Country - South America Semiconductor FFKM O-ring Sales, (K Pcs), 2017-2022

South America	2017	2018	2019	2020	2021	2022
Mexico	4.89	5.49	4.56	5.44	6.61	7.36
Brazil	5.73	6.43	5.64	6.87	8.58	9.18
Rest of South America	2.93	3.3	2.84	3.45	4.21	4.63
Total	13.55	15.22	13.04	15.76	19.4	21.17

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

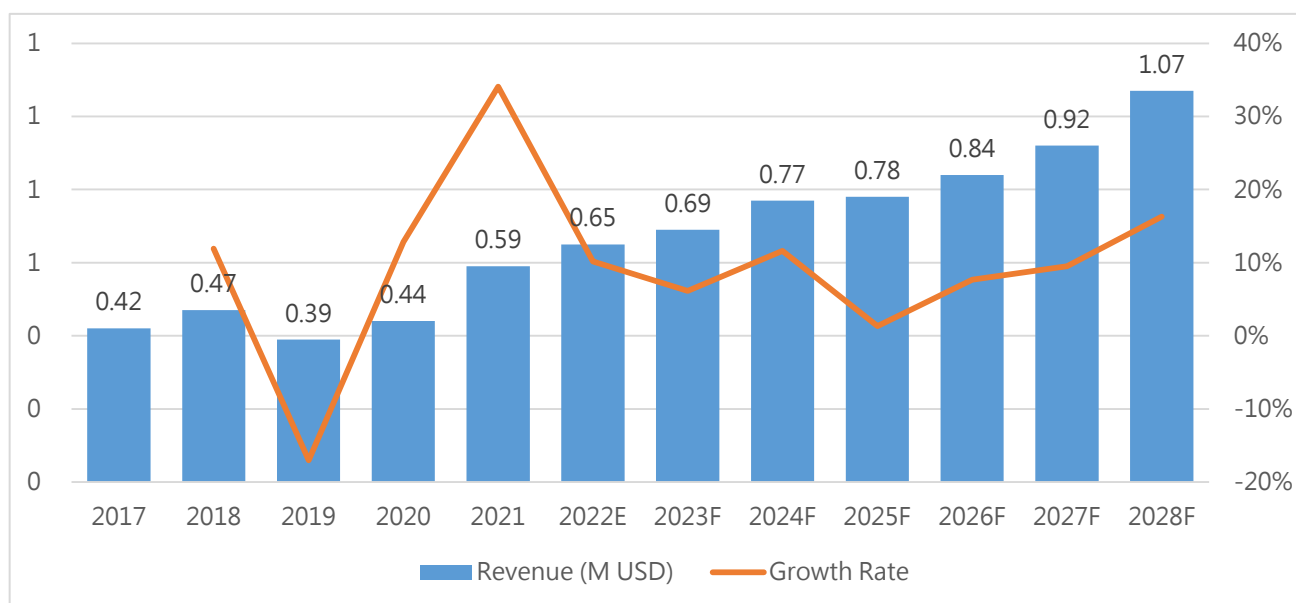
Table 41. By Country - South America Semiconductor FFKM O-ring Sales, (K Pcs), 2023-2028

South America	2023	2024	2025	2026	2027	2028
Mexico	7.83	8.48	9.02	9.53	10.73	11.8
Brazil	10.22	10.77	11.66	12.37	13.91	15.11
Rest of South America	5.1	5.4	5.77	6.32	7.03	7.72
Total	23.15	24.65	26.45	28.22	31.67	34.63

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.7.3 Mexico Semiconductor FFKM O-ring Market Size, 2017-2028

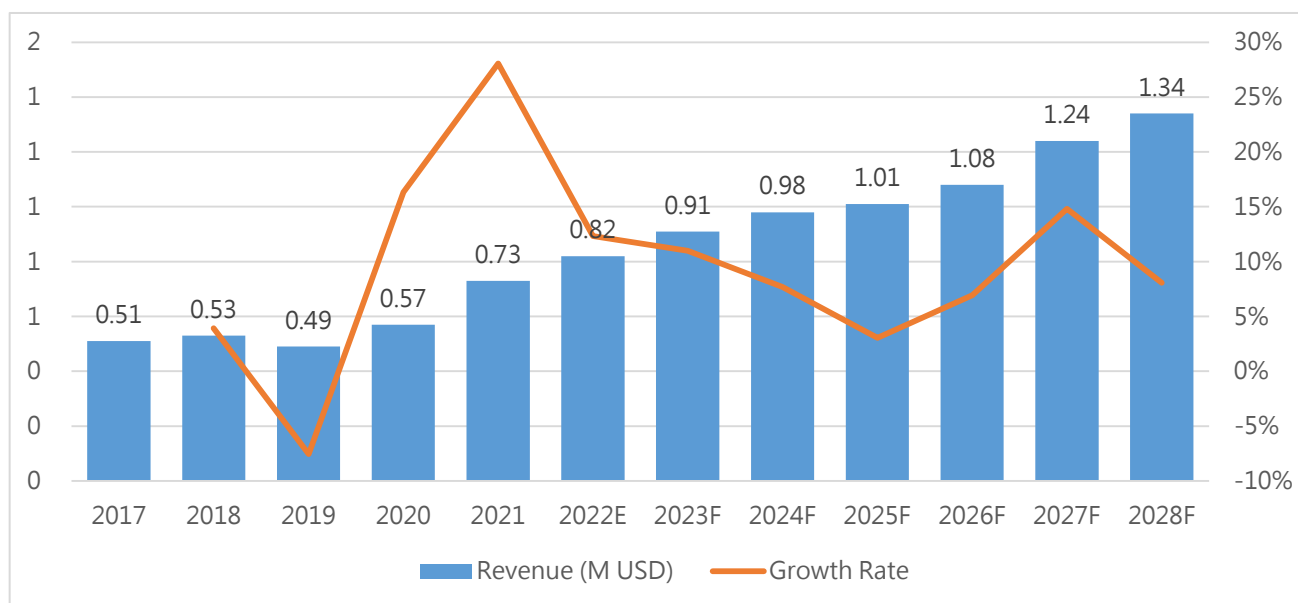
Figure 31. Mexico Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.7.4 Brazil Semiconductor FFKM O-ring Market Size, 2017-2028

Figure 32. Brazil Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.8 Middle East & Africa

6.8.1 By Country - Middle East & Africa Semiconductor FFKM O-ring Revenue, 2017-2028

Table 42. By Country - Middle East & Africa Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2022

Middle East & Africa	2017	2018	2019	2020	2021	2022
Israel	0.46	0.51	0.45	0.49	0.65	0.73
Rest of Middle East & Africa	0.27	0.29	0.25	0.28	0.38	0.45
Total	0.73	0.8	0.7	0.77	1.03	1.18

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

Table 43. By Country - Middle East & Africa Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2023-2028

Middle East & Africa	2023	2024	2025	2026	2027	2028
Israel	0.75	0.83	0.84	0.91	0.97	1.13
Rest of Middle East & Africa	0.46	0.49	0.49	0.53	0.58	0.62
Total	1.21	1.32	1.33	1.44	1.55	1.75

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.8.2 By Country - Middle East & Africa Semiconductor FFKM O-ring Sales, 2017-2028

Table 44. By Country - Middle East & Africa Semiconductor FFKM O-ring Sales, (K Pcs), 2017-2022

Middle East & Africa	2017	2018	2019	2020	2021	2022
Israel	5.31	5.9	4.96	6	7.4	7.99
Rest of Middle East & Africa	3.21	3.45	2.97	3.6	4.43	4.85
Total	8.52	9.35	7.93	9.6	11.83	12.84

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

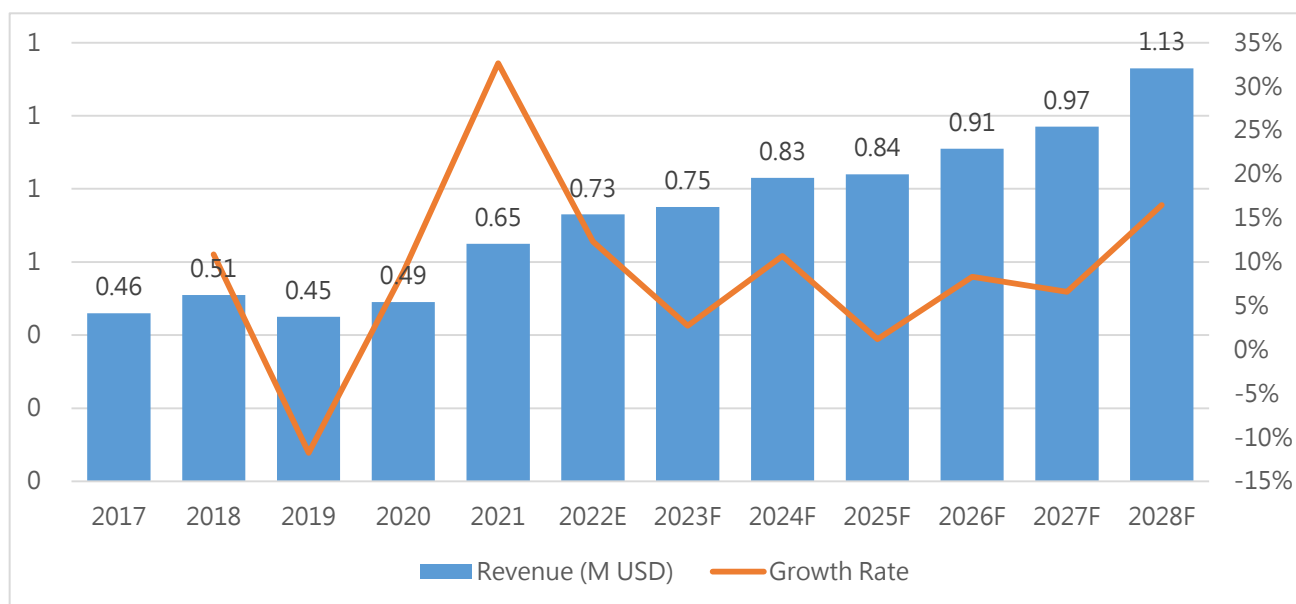
Table 45. By Country - Middle East & Africa Semiconductor FFKM O-ring Sales, (K Pcs), 2023-2028

Middle East & Africa	2023	2024	2025	2026	2027	2028
Israel	8.72	9.1	9.8	10.58	11.5	12.52
Rest of Middle East & Africa	5.23	5.51	5.75	6.04	6.56	7.01
Total	13.95	14.61	15.55	16.62	18.06	19.53

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

6.8.3 Israel Semiconductor FFKM O-ring Market Size, 2017-2028

Figure 33. Israel Semiconductor FFKM O-ring Revenue, (US\$, Mn), 2017-2028



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

7 Manufacturers & Brands Profiles

The report profiles the key players in Global.

7.1 DuPont

7.1.1 DuPont Corporate Summary

Table 46. Dupont Corporate Summary

Item	Description
■ Company Name	Dupont
■ Website	https://www.dupont.com/
■ Establish Date	1802
■ Semiconductor O-ring Manufacturing Bases	FFKM Europe, USA, China
■ Sales Regions	Global
■ Headquarters	USA
■ Company Nature	Public
■ Contact Information	Tel: +1-866-644-4129 +1 201-680-6578 +1 800-231-5469

SOURCE: DUPONT; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.1.2 DuPont Business Overview

DuPont de Nemours, Inc., commonly known as DuPont, is an American company formed by the merger of Dow Chemical and E. I. du Pont de Nemours and Company on August 31, 2017, and the subsequent spinoffs of Dow Inc. and Corteva. Prior to the spinoffs it was the world's largest chemical company in terms of sales. The merger has been reported to be worth an estimated \$130 billion. With 2018 total revenue of \$86 billion, DowDuPont ranked No. 35 on the 2019 Fortune 500 list of the largest United States public corporations. DuPont is headquartered in Wilmington, Delaware, in the state where it is incorporated, since the founding of the old DuPont in 1802.

7.1.3 DuPont Semiconductor FFKM O-ring Major Product Offerings

Table 47. DuPont Semiconductor FFKM O-ring Product Offerings

Product	Feature
Standard O-rings	The dimensions and tolerances of Kalrez® O-rings are listed and conform to AS-568. DuPont and its local authorized distributors of Kalrez® parts maintain inventories of many standard AS-568 O-rings.
Metric O-rings	The dimensions and tolerances of Kalrez® O-rings in metric sizes are listed. DuPont and its local authorized Kalrez® distributors maintain certain inventories of common metric sizes but a full range of metric sizes is not normally inventoried.
JIS O-rings	Many Japanese Industry Standard (JIS) O-ring sizes in compounds listed may be available for immediate shipment from your local authorized DuPont™ Kalrez® distributor's inventory.
Custom O-rings	Kalrez® O-rings are also available in custom cross-section and/or diameter dimensions and tolerances.
Splice & Join O-rings	Kalrez® Splice & Join O-rings can be produced in a broad range of customized cross-section and diameter dimensions to meet specific needs. Cross sections are available within a range of 0.118 to 0.500" (3.00 mm to 12.70 mm) for many compounds with a minimum inside diameter of 26.000" (660.40 mm). Kalrez® Splice & Join O-rings are typically made to order.

SOURCE: DUPONT AND MARKET MONITOR GLOBAL, INC, 2022

7.1.4 Dupont Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 48. DuPont Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Dupont	2017	2018	2019	2020	2021	2022
Sales	194.54	210.89	192.49	222.23	274.71	308.45
Revenue	15.37	16.24	15.59	16.67	21.98	25.29
Price	156	148	156	152	158	165
Gross Margin	50.61%	49.57%	48.34%	43.72%	46.01%	48.34%

SOURCE: DUPONT; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.1.5 DuPont Key News

DuPont Wins Five 2022 R&D 100 Awards, Highlighting Innovative Technologies.

7.2 Greene Tweed

7.2.1 Greene Tweed Corporate Summary

Table 49. Greene Tweed Corporate Summary

Item	Description
■ Company Name	Greene Tweed
■ Website	https://www.gtweed.com/
■ Establish Date	1863
■ Semiconductor FFKM O-ring Manufacturing Bases	USA, Asia, Europe, Middle East
■ Sales Regions	Global
■ Headquarters	USA
■ Company Nature	Public
■ Contact Information	Tel: + 1.215.256.9521 Fax: +1.215.256.0189 Toll-free: 1.800.220.4733

SOURCE: GREENE TWEED; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.2.2 Greene Tweed Business Overview

Greene Tweed is a leading global manufacturer of high-performance thermoplastics, composites, and engineered components, including custom-engineered sealing solutions for the aerospace/defense, energy, semiconductor, industrial, life sciences, and chemical processing industries.

7.2.3 Greene Tweed Semiconductor FFKM O-ring Major Product Offerings

Table 50. Greene Tweed Semiconductor FFKM O-ring Product Offerings

Product	Feature
	FFKM, or perfluoroelastomer, contains higher amounts of fluorine than standard FKM, and features higher temperature ratings, up to approximately 325°C (617°F). FFKM also has improved chemical resistance, with nearly universal chemical compatibility. This combination of high-performance capabilities makes FFKM seals the premium choice for the most challenging applications.
Chemraz® FFKM	The first commercially available FFKM seal was produced in the late 1960s. However, widespread manufacturing of FFKM materials did not occur until the late 1980s due to patent restrictions. FFKM is used in O-rings and seals in environments with high temperatures and/or harsh chemicals in the aerospace, semiconductor, energy, pharmaceutical, and industrial industries.

Greene Tweed's Chemraz® is the ultimate elastomeric FFKM material. Chemraz® is a polymer of three or more monomers in which all hydrogen positions have been replaced with fluorine. It has the broadest chemical resistance of any elastomeric material.

SOURCE: GREENE TWEED AND MARKET MONITOR GLOBAL, INC, 2022

7.2.4 Greene Tweed Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 51. Greene Tweed Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Greene Tweed	2017	2018	2019	2020	2021	2022
Sales	101.53	110.86	92.78	115.44	142.49	154.22
Revenue	13.30	14.19	12.06	14.55	18.24	20.36
Price	131	128	130	126	128	132
Gross Margin	46.14%	44.99%	46.83%	42.53%	47.88%	47.81%

SOURCE: GREENE TWEED; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.2.5 Greene Tweed Key News

Greene Tweed's Product Test Laboratory (PTL) designs and builds custom test systems to simulate end-use applications for Greene Tweed products.

Greene Tweed focuses on the performance and reliability of the parts delivered for every aircraft, plasma chamber and oil exploration equipment produced for our customers. PTL is proud to certify that Greene Tweed parts lead the industry standard in quality and performance.

7.3 Trelleborg Group

7.3.1 Trelleborg Group Corporate Summary

Table 52. Trelleborg Group Corporate Summary

Item	Description
■ Company Name	Trelleborg Group
■ Website	https://www.trelleborg.com/
■ Establish Date	1905
■ Semiconductor FFKM O-ring Manufacturing Bases	USA
■ Sales Regions	Global
■ Headquarters	Sweden
■ Company Nature	Public

■ **Contact Information** Tel: +46 410 670 00

SOURCE: TRELLEBORG GROUP; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.3.2 Trelleborg Group Business Overview

Trelleborg is a world leader in engineered polymer solutions that seal, damp and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way. The Trelleborg Group has annual sales of about SEK 34 billion (EUR 3.34 billion, USD 3.95 billion) in about 50 countries. The Group comprises three business areas: Trelleborg Industrial Solutions, Trelleborg Sealing Solutions and Trelleborg Wheel Systems. The Trelleborg share has been listed on the Stock Exchange since 1964 and is listed on Nasdaq Stockholm, Large Cap.

7.3.3 Trelleborg Group Semiconductor FFKM O-ring Major Product Offerings

Table 53. Trelleborg Group Semiconductor FFKM O-ring Product Offerings

Product	Feature
Isolast® Perfluoroelastomer O-Ring	Isolast® is Trelleborg Sealing Solutions proprietary perfluoroelastomer. It combines the elastic properties of fluorocarbon (FKM) with the outstanding chemical resistance and the high temperature stability of PTFE. Isolast® seals can be used for applications in high temperature service up to +325 °C / +615 °F. Isolast® O-Rings are available in metric and inch dimensions to ISO 3601 and AS 568 for various applications in Oil and Gas, Semiconductor, Aerospace and chemical processing Industry.

SOURCE: TRELLEBORG GROUP AND MARKET MONITOR GLOBAL, INC, 2022

7.3.4 Trelleborg Group Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 54. Trelleborg Group Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Trelleborg Group	2017	2018	2019	2020	2021	2022
Sales	93.66	102.74	86.60	104.88	126.35	134.76
Revenue	12.83	13.97	12.38	14.58	18.19	19.81
Price	137	136	143	139	144	147
Gross Margin	47.60%	49.47%	47.75%	44.55%	46.49%	44.86%

SOURCE: TRELLEBORG GROUP; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.3.5 Trelleborg Group Key News

As manufacturers learn the benefits of thermoplastic composites and apply them to novel applications, pressure to process material faster and more cost-efficiently has steadily been increasing. To meet this increased demand, Trelleborg Sealing Solutions has explored thermoplastic manufacturing technologies, especially in-situ fabrication with Automated Fiber Placement (AFP). Though already used for serial production over the last two decades, improved understanding of AFP processes and evolution of the technologies involved has seen manufacturing costs reduced and performance of the resulting products

improve.

7.4 Freudenberg

7.4.1 Freudenberg Corporate Summary

Table 55. Freudenberg Corporate Summary

Item	Description
■ Company Name	Freudenberg
■ Website	https://www.freudenberg.com/
■ Establish Date	2011
■ Semiconductor FFKM O-ring Manufacturing Bases	Germany
■ Sales Regions	Global
■ Headquarters	Germany
■ Company Nature	Private
■ Contact Information	Phone: +49 6201 80-0 Fax: +49 6201 88-0

SOURCE: FREUDENBERG; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.4.2 Freudenberg Business Overview

In 2022, Freudenberg stands out as an agile and agile global technology company with science-based standards for progress. Freudenberg employees are experts in leading technical products, services and solutions used in thousands of applications and in approximately 40 market segments. Freudenberg's seals, vibration control components, technical textiles, filters, cleaning technology, specialty chemicals and medical technology products make a valuable contribution to the success of Freudenberg's customers worldwide. The company has always been a family business, with founder Carl Johann Freudenberg's values keeping the company grounded. Freudenberg has been faithful to them since 1849.

7.4.3 Freudenberg Semiconductor FFKM O-ring Major Product Offerings

Table 56. Freudenberg Semiconductor FFKM O-ring Product Offerings

Product	Feature
FFKM O-ring	From standard O-Rings to customized shapes, sizes and applications, Simriz® FFKM compounds are designed and engineered to accommodate a wide variety of industrial requirements and are available in custom-molded shapes to provide even greater design flexibility.

SOURCE: FREUDENBERG AND MARKET MONITOR GLOBAL, INC, 2022

7.4.4 Freudenberg Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 57. Freudenberg Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Freudenberg	2017	2018	2019	2020	2021	2022
Sales	93.05	92.48	80.65	97.50	110.02	120.82
Revenue	11.35	11.01	9.76	11.60	13.53	15.71
Price	122	119	121	119	123	130
Gross Margin	47.80%	46.54%	48.96%	43.50%	48.04%	49.05%

SOURCE: FREUDENBERG; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.4.5 Freudenberg Key News

1. Freudenberg develops food-compliant seals for innovative hydro-hydraulic process valves.
2. Freudenberg Sealing Technologies will be presenting food compliant materials and seals at drinktec 2022 trade show from September 12-16 in Munich (Germany) in Hall B3.249. These products and materials are certified to meet the latest regulatory requirements for food contact materials and address the temperature, media resistance and CIP/SIP needs prevalent in the food sector.

7.5 TRP Polymer Solutions

7.5.1 TRP Polymer Solutions Corporate Summary

Table 58. TRP Polymer Solutions Corporate Summary

Item	Description
■ Company Name	TRP Polymer Solutions
■ Website	https://trp.co.uk/
■ Establish Date	2004
■ Semiconductor FFKM O-ring Manufacturing Bases	UK
■ Sales Regions	Global
■ Headquarters	UK
■ Company Nature	Private
■ Contact Information	Tel:+44 (0)1432 268899

SOURCE: TRP POLYMER SOLUTIONS; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.5.2 TRP Polymer Solutions Business Overview

Founded in 2004 and headquartered in Hereford, UK, TRP Polymer Solutions designs, develops and manufactures custom rubber mouldings and 'O' rings for industries worldwide including chemical processing,

oil and gas, aerospace, nuclear energy , Pharmaceutical, Motorsports and Medical. Supplying North America, Central & South America, Europe, Africa, Middle East, South Asia, Asia Pacific and Oceania.

TRP Polymer Solutions has the capability to manufacture high- or low-volume assemblies, including O-rings, seals and gaskets, down to individual parts if required.

7.5.3 TRP Polymer Solutions Semiconductor FFKM O-ring Major Product Offerings

Table 59. TRP Polymer Solutions Semiconductor FFKM O-ring Product Offerings

Product	Feature
FFKM O-rings	High density
	Best in class chemical resistance
	Manufactured to ISO9001 standards
	Suitable for explosive decompression
	Wide temperature range (-40 °C to +330 °C)
	Self-extinguishing and non-flammable in air
	Excellent weatherability and ozone resistance
	Excellent gas and liquid permeation resistance
	Suitable for CIP, SIP and hygienic applications
	Specific grades already tested and formulated
	Raw compounds sourced from approved suppliers
Good mechanical properties and sealing performance	

SOURCE: TRP POLYMER SOLUTIONS AND MARKET MONITOR GLOBAL, INC, 2022

7.5.4 TRP Polymer Solutions Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 60. TRP Polymer Solutions Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

TRP Polymer Solutions	2017	2018	2019	2020	2021	2022
Sales	84.10	96.89	82.94	102.94	126.71	135.76
Revenue	10.51	11.82	10.45	12.56	15.59	17.38
Price	125	122	126	122	123	128
Gross Margin	45.11%	45.18%	44.75%	42.08%	45.54%	45.09%

SOURCE: TRP POLYMER SOLUTIONS; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.5.5 TRP Polymer Solutions Key News

In rubber manufacturing, nothing is accidental. Even the smallest, most innocuous rubber parts undergo rigorous virtual and laboratory testing to simulate their behavior in real-world application environments. All this knowledge is then turned into a prototype to provide a proof of concept. Here, TRP Polymer Solutions explains what rubber part prototyping is all about and how it can ultimately save you time and money.

Unless you're actively working in the rubber manufacturing industry, or partnering with a rubber manufacturer

to bring ideas to production, you probably won't take into account the amount of testing and prototyping of rubber products around you. In fact, TRP Polymer Solutions has spared no expense, and precise computer modeling and accurate rubber prototyping help to simplify the entire production process.

7.6 Gapi

7.6.1 Gapi Corporate Summary

Table 61. Gapi Corporate Summary

Item	Description
■ Company Name	Gapi
■ Website	https://www.gapi.co.uk/
■ Establish Date	1998
■ Semiconductor FFKM O-ring Manufacturing Bases	Italy
■ Sales Regions	Global
■ Headquarters	Italy
■ Company Nature	Private
■ Contact Information	Email: sales@gapi.co.uk

SOURCE: GAPI; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.6.2 Gapi Business Overview

Gapi Limited is a leading supplier to the UK Markets of Sealing Solution Products and PTFE Semi-Finished Materials and Finished Parts

Established in 1998 when Gapi Group, looking to expand its PTFE production portfolio acquired the Polypenco division of DSM in Welwyn Garden City.

In 2000 Gapi Limited moved into brand new warehousing premises in Rotherham. This was closely followed by the relocation of the production facility from Welwyn Garden City back to the Group manufacturing home in Italy.

Gapi Limited operating out of Rotherham quickly became a major source of Rubber Sealing and PTFE semi-finished product to the industry.

7.6.3 Gapi Semiconductor FFKM O-ring Major Product Offerings

Table 62. Gapi Semiconductor FFKM O-ring Product Offerings

Product	Feature
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FFKM O RINGS

Gapi's full line of GPlast perfluoroelastomers is now available to meet performance and application requirements. (FFKM O-ring)

With excellent chemical and thermal resistance, Gapi's FFKM O-rings combine the sealing properties of elastomers with chemical resistance comparable to PTFE.

Covering all markets, with advanced polymer development and process control innovations, Gapi can be the first choice for all your FFKM O-ring needs.

SOURCE: GAPI AND MARKET MONITOR GLOBAL, INC, 2022

7.6.4 Gapi Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 63. Gapi Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Gapi	2017	2018	2019	2020	2021	2022
Sales	101.93	116.65	99.32	119.42	147.35	157.66
Revenue	9.48	10.62	9.34	10.99	14.00	15.61
Price	93	91	94	92	95	99
Gross Margin	42.88%	43.73%	45.05%	41.21%	44.00%	44.23%

SOURCE: GAPI; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.6.5 Gapi Key News

In 2020, Gapi produced the latest sealing profiles, including BLF® Low Friction Rod Seals and AS® TPU Mechanically Powered Rod Seals.

7.7 Maxmold Polymer Co., Ltd.

7.7.1 Maxmold Polymer Co., Ltd. Corporate Summary

Table 64. Maxmold Polymer Co., Ltd. Corporate Summary

Item	Description
■ Company Name	Maxmold Polymer Co., Ltd.
■ Website	https://www.maxmold.com/
■ Establish Date	1999
■ Semiconductor O-ring Manufacturing Bases	FFKM China Taiwan
■ Sales Regions	Global
■ Headquarters	China Taiwan
■ Company Nature	Private
■ Contact Information	Tel: +886-3-5380817 Fax: +886-3-5380827

SOURCE: MAXMOLD POLYMER CO., LTD.; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.7.2 Maxmold Polymer Co., Ltd. Business Overview

In Taiwan’s industrial sector, one in three FKM O-RINGS is made by Maxmold Polymer Co., Ltd. Katon’s FFKM O-RING brand is KATON® , which includes FKM & FFKM.

KATON® is the source manufacturer of FKM O-RINGS. In Taiwan, Maxmold Polymer Co., Ltd. is the only company focused on FKM O-RING production. They produce over one million FKM O-RINGS every week.

7.7.3 Maxmold Polymer Co., Ltd. Semiconductor FFKM O-ring Major Product Offerings

Table 65. Maxmold Polymer Co., Ltd. Semiconductor FFKM O-ring Product Offerings

Product	Feature
KATON PF587 FFKM O-RING	KATON® PF587 is a perfluoro-elastomer (FFKM) offering wide operational range and superior compression set resistance, thanks to its unique peroxide curing system that does not need any coagent (TAIC or equivalent) for curing to be carried out.
KATON PF586 FFKM O-RING	KATON® PF586 is a perfluoro-elastomer (FFKM) offering wide operational range and superior compression set resistance, thanks to its unique peroxide curing system that does not need any coagent (TAIC or equivalent) for curing to be carried out.
KATON PF326 FFKM O-RING	KATON® PF326 is a chemical resistant perfluoroelastomer (FFKM). KATON® PF326 offers the widest range of media sealing capabilities along with excellent compression set values.
KATON PF325 FFKM O-RING	KATON® PF325 is a chemical resistant perfluoroelastomer (FFKM). KATON® PF325 offers the widest range of media sealing capabilities along with excellent compression set values.
KATON PF90V FFKM O-RING	KATON® PF90V is a peroxide curable Perfluoro-elastomer (FFKM) designed for high performance semiconductor manufacturing applications where both high purity and low particle generation are required.

SOURCE: MAXMOLD POLYMER CO., LTD. AND MARKET MONITOR GLOBAL, INC, 2022

7.7.4 Maxmold Polymer Co., Ltd. Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 66. Maxmold Polymer Co., Ltd. Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Maxmold Polymer Co., Ltd.	2017	2018	2019	2020	2021	2022
Sales	55.67	55.02	46.92	63.35	74.16	86.36
Revenue	8.68	8.14	7.32	9.63	11.72	14.25
Price	79	77	81	75	80	82

Gross Margin	44.34%	46.73%	45.73%	41.32%	47.20%	46.80%
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SOURCE: MAXMOLD POLYMER CO., LTD.; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.7.5 Maxmold Polymer Co., Ltd. Key News

From December 15th to December 18th, 2021, Maxmold Polymer Co., Ltd. participated in the Taiwan Robotics and Intelligent Automation Exhibition and the Taipei International Automation Industry Exhibition as an exhibitor.

7.8 Yoson

7.8.1 Yoson Corporate Summary

Table 67. Yoson Corporate Summary

Item	Description
■ Company Name	Yoson
■ Website	https://www.yosonseals.com/
■ Establish Date	2006
■ Semiconductor	FFKM
■ O-ring	China
■ Manufacturing Bases	
■ Sales Regions	Global
■ Headquarters	China
■ Company Nature	Private
	Email: sales@yosonseals.com
■ Contact Information	Tel:
	+86 15024041603
	+86 15024041603

SOURCE: YOSON; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.8.2 Yoson Business Overview

Yoson is a technology-based company specializing in the research and development of sealing materials, the design and production of sealing products.

Since its establishment, Yoson has been focusing on the development and application of high-performance rubber and plastic materials. In terms of fluorine materials, polymer materials and nanotechnology, the company closely follows the frontier of the world's material science development and combines its own sealing technology to develop and produce seals that can meet the requirements of complex working conditions from low temperature -250 °C to high temperature. Temperature resistance 700 °C , strong acid and alkali, high radiation, high pressure, high linear speed, high shaft runout, etc.

The company's products have been developed and applied in high-tech industries such as food, medical, military, chemical, machinery and aerospace, especially in the development of high-end customers such as military and aerospace. Yongsheng has the confidence and ability to produce seals that can replace internationally renowned brands. product.

In terms of sealing mechanism research, based on years of experience in sealing structure design, Yongsheng constantly innovates and develops new high-performance sealing products. Yoson has a professional R&D and design team, strict quality control system and exquisite processing technology, which have laid a solid foundation for the quality of sealing products.

At present, as the domestic industrial machinery and equipment industry is in line with international standards, the safety requirements for continuous operation of equipment have increased. The reliability of sealing products is more important, which is the main reason why well-known equipment manufacturers at home and abroad always pay attention to sealing products. The trend of changes in user needs is reflected in the harsh working environment, extreme temperature environment, high pressure, and high speed of mechanical equipment. These changes have put forward higher requirements for the design and manufacture of sealing products, especially the selection of sealing materials. It meets the special requirements of ultra (low, high) temperature, corrosion resistance, wear resistance and so on.

Yoson is dedicated to solving sealing problems in extreme conditions. The sealing scheme can be customized according to the customer's working conditions, to meet the customer's needs for various sealing products, and to solve the problem of sealing leakage with professional knowledge and experience. Yoson's goal is to make Made in China win the seal and be the best seal manufacturer!

7.8.3 Yoson Semiconductor FFKM O-ring Major Product Offerings

Table 68. Yoson Semiconductor FFKM O-ring Product Offerings

Product	Feature
Perfluoroelastomer FFKM 6375 O-Rings	FFKM 6375 has a broad spectrum of chemical resistance and is suitable for use in environments where multiple chemical media coexist, with good resistance to water and steam.
Perfluoroelastomer FFKM 4079 O-Rings	FFKM 4079 has excellent chemical resistance and excellent compression and deformation characteristics at high temperatures. The temperature should be below 280 °C with thermal cycling.
Perfluoroelastomer FFKM 7075 O-Rings	FFKM 7075 has a lower compression set compared to 4079 and has a better sealing ability and high-temperature resistance, and FFKM 7075 can work at 327 degrees Celsius.
Perfluoroelastomer FFKM 2085 O-Rings	FFKM 2085 has excellent fast gas decompression performance. Its high stiffness and high modulus resist extrusion in high-pressure applications.
Perfluoroelastomer FFKM 3065 O-Rings	FFKM 3065 It has good all-around chemical resistance and excellent resistance to acid oils and amines up to 288°C.
Perfluoroelastomer FFKM 0090	Used in the oil and gas industry, high hardness, excellent

FFKM O-Rings 0090 resistance to implosion, Norsok M-710 certified.

SOURCE: YOSON AND MARKET MONITOR GLOBAL, INC, 2022

7.8.4 Yoson Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 69. Yoson Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Yoson	2017	2018	2019	2020	2021	2022
Sales	140.06	160.87	135.61	147.60	206.45	230.14
Revenue	8.12	8.85	7.73	8.27	12.18	13.81
Price	58	55	57	56	59	60
Gross Margin	42.15%	42.95%	43.94%	39.76%	45.67%	47.17%

SOURCE: YOSON; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.8.5 Yoson Key News

Yoson doesn't have representative development recently.

7.9 Precision Polymer Engineering (PPE)

7.9.1 Precision Polymer Engineering (PPE) Corporate Summary

Table 70. Precision Polymer Engineering (PPE) Corporate Summary

Item	Description
■ Company Name	Precision Polymer Engineering (PPE)
■ Website	https://www.prepol.com/products/
■ Establish Date	1975
■ Semiconductor	FFKM
■ O-ring	UK, USA
■ Manufacturing Bases	
■ Sales Regions	US, Europe, Asia
■ Headquarters	UK
■ Company Nature	Private
■ Contact Information	Tel: +44 (0)1254 295400

SOURCE: PRECISION POLYMER ENGINEERING (PPE); SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.9.2 Precision Polymer Engineering (PPE) Business Overview

Precision Polymer Engineering Ltd (PPE) is a leading provider of high performance O-rings, technical rubber moldings and sealing solutions to a diverse range of industries across the world.

Founded in 1975, with its head office in Blackburn, England, PPE operates manufacturing facilities in the UK and the US, plus sales offices and dealers across the US, Europe and Asia. The company's success is based on the continual development of new elastomer materials combined with exceptional levels of customer service and technical support.

7.9.3 Precision Polymer Engineering (PPE) Semiconductor FFKM O-ring Major Product Offerings

Table 71. Precision Polymer Engineering (PPE) Semiconductor FFKM O-ring Product Offerings

Product	Feature
Perlast® FFKM O-rings	Precision Polymer Engineering manufactures and supplies fully molded elastomer O-rings from 1.5mm (0.06") to 2.5 metres (8ft) outer diameter, and 0.8mm (0.03") to 12mm (0.47") cross section. Rubber O-rings can be manufactured in both small and large volumes, from just 1 O-ring up to 1 million+.

SOURCE: PRECISION POLYMER ENGINEERING (PPE) AND MARKET MONITOR GLOBAL, INC, 2022

7.9.4 Precision Polymer Engineering (PPE) Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 72. Precision Polymer Engineering (PPE) Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Precision Polymer Engineering (PPE)	2017	2018	2019	2020	2021	2022
Sales	75.74	86.48	75.68	94.37	110.91	121.25
Revenue	6.89	7.78	7.19	8.59	10.43	12.00
Price	91	90	95	91	94	99
Gross Margin	46.32%	47.64%	48.61%	43.14%	46.99%	49.45%

SOURCE: PRECISION POLYMER ENGINEERING (PPE); SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.9.5 Precision Polymer Engineering (PPE) Key News

SEMICON Taiwan is Taiwan's premier microelectronics manufacturing event, shaping the future of design and manufacturing of semiconductors, nanoelectronics, MEMS, photovoltaics and related advanced electronics.

Taiwan's semiconductor industry has grown tremendously over the past 30 years and has become one of the world's leading IC producers. SEMICON Taiwan 2022 will be another milestone in this growing trend.

Precision Polymer Engineering is exhibiting this September. Perlast™ Helios, along with other high-performance sealing solutions for critical semiconductor applications, will be showcased in Hall #N1269, Booth 4F.

7.10 Fluorez Technology

7.10.1 Fluorez Technology Corporate Summary

Table 73. Fluorez Technology Corporate Summary

Item	Description
■ Company Name	Fluorez Technology
■ Website	http://www.fluorez.com/
■ Establish Date	2005
■ Semiconductor FFKM O-ring Manufacturing Bases	China Taiwan
■ Sales Regions	Global
■ Headquarters	China Taiwan
■ Company Nature	Private
■ Contact Information	Tel : +886-2-22173688 Fax : +886-2-22176411

SOURCE: FLUOREZ TECHNOLOGY; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.10.2 Fluorez Technology Business Overview

Fluorez Technology was established in 2005 and is dedicated to the global fluorinated elastomer business. With offices in Taipei, Taiwan, Fluorez Technology works closely with local manufacturers to provide customers with the best solutions.

Fluorez Technology is not only a FFKM/FKM compound machine, but also hopes to provide molded parts, knowledge and experience to help Fluorez Technology customers find the best products, thus saving more time and money. Fluorez Technology's extensive product line offers a wide selection of FKM (Fluoroelastomer)/FFKM (Perfluoroelastomer) as well as a complete list of molded parts. Fluorez Technology also accepts custom orders to meet customer specific needs for FKM/FFKM composites and parts. Based on Fluorez Technology's many years of experience in FKM and FFKM combination, Fluorez Technology is confident to provide customers with competitive prices and quality assurance.

7.10.3 Fluorez Technology Semiconductor FFKM O-ring Major Product Offerings

Table 74. Fluorez Technology Semiconductor FFKM O-ring Product Offerings

Product	Feature
Standard O-ring in AS-568, JIS B2401, JIS P, JIS V, JIS G,	A range of Varion™ FFKM parts were developed by Fluorez Technology to help Fluorez Technology customers easily transfer from previous suppliers. Customers who have previously used Kalrez ® products can also find their peers in Fluorez

JIS S and international metric. Technology's product listings. Fluorez Technology has the FC series of chemical resistant compounds and the FT series of temperature resistant compounds, as well as the high purity FFKM in the FU series. Custom composite designs are available upon request. Fluorez Technology offers AS-568, JIS B2401, JIS P, JIS V, JIS G, JIS S and International Metric Standard O-rings.

SOURCE: FLUOREZ TECHNOLOGY AND MARKET MONITOR GLOBAL, INC, 2022

7.10.4 Fluorez Technology Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 75. Fluorez Technology Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Fluorez Technology	2017	2018	2019	2020	2021	2022
Sales	84.02	96.23	80.02	101.96	127.10	137.05
Revenue	5.88	6.64	5.68	7.24	9.28	10.28
Price	70	69	71	71	73	75
Gross Margin	41.79%	39.85%	41.31%	40.70%	39.70%	37.67%

SOURCE: FLUOREZ TECHNOLOGY; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.10.5 Fluorez Technology Key News

Fluorez Technology doesn't have representative development recently.

7.11 Applied Seals Co. Ltd.

7.11.1 Applied Seals Co. Ltd. Corporate Summary

Table 76. Applied Seals Co. Ltd. Corporate Summary

Item	Description
■ Company Name	Applied Seals Co. Ltd.
■ Website	https://www.appliedseals.com/
■ Establish Date	1979
■ Semiconductor FFKM O-ring Manufacturing Bases	China Taiwan
■ Sales Regions	Global
■ Headquarters	China Taiwan
■ Company Nature	Private
■ Contact Information	TEL: +886-4-781-2299 FAX: +886-4-781-0289

SOURCE: APPLIED SEALS CO. LTD.; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.11.2 Applied Seals Co. Ltd. Business Overview

Applied Seals Co. Ltd. is dedicated to improving ultra-clean processing and maximizing manufacturing efficiency, delivering the next generation of advanced sealing components for the semiconductor, solar, pharmaceutical and biotechnology markets.

All Applied Seals manufacturing processes are strictly controlled. The manufacture and packaging of Viton seals for demanding semiconductor applications takes place in a class 100 clean room environment.

Applied Seals provides highly reliable sealing solutions at low cost and with short lead times. Applied Seals products are proven to maintain high-integrity seals while being able to withstand thermal changes, harsh chemicals and ultrafine particles encountered in high-tech manufacturing equipment. Applied Seals even offers recyclable "green" seals.

With years of experience and knowledge in the field, Applied Seals is committed to supplying an excellent range of rubber seals that can be used in a variety of machines to prevent oil from escaping through crevices. Applied Seals' rubber product line includes a wide range of elastomeric hydraulic seals, pneumatic seals, aerospace seals, medical seals, FFKM seals, perfluoro-elastomer O-rings, explosive decompression seals, and more with a wide range of quality characteristics Customer praise. The seals provided are thoroughly manufactured in Applied Seals state-of-the-art production cells using high-quality rubber and cutting-edge technology to specified quality standards.

7.11.3 Applied Seals Co. Ltd. Semiconductor FFKM O-ring Major Product Offerings

Table 77. Applied Seals Co. Ltd. Semiconductor FFKM O-ring Product Offerings

Product	Feature
PERFREZ® Semiconductor grade	PERFREZ® Semiconductor grades include PERFREZ® 6001C, PERFREZ® 6012C, PERFREZ® 6022C, PERFREZ® 6040E, PERFREZ® 6075D.
PERFREZ® Industrial grade	PERFREZ® Industrial grades include PERFREZ® 9001, PERFREZ® 9021, PERFREZ® 9071, PERFREZ® 9131E.

SOURCE: APPLIED SEALS CO. LTD. AND MARKET MONITOR GLOBAL, INC, 2022

7.11.4 Applied Seals Co. Ltd. Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 78. Applied Seals Co. Ltd. Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Applied Seals Co. Ltd.	2017	2018	2019	2020	2021	2022
Sales	64.43	75.90	65.23	82.73	95.12	107.28
Revenue	4.96	5.69	5.15	6.45	7.61	9.01

Price	77	75	79	78	80	84
Gross Margin	40.51%	40.54%	42.16%	37.17%	43.21%	42.89%

SOURCE: APPLIED SEALS CO. LTD.; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.11.5 Applied Seals Co. Ltd. Key News

Applied Seals Co., Ltd. participated in SEMICON Taiwan 2022 as an exhibitor.

7.12 Parco

7.12.1 Parco Corporate Summary

Table 79. Parco Corporate Summary

Item	Description
■ Company Name	Parco
■ Website	https://www.parcoinc.com/
■ Establish Date	1941
■ Semiconductor O-ring Manufacturing Bases	FFKM United States
■ Sales Regions	Global
■ Headquarters	United States
■ Company Nature	Private
■ Contact Information	UAN: (021) 111-392-567 Tel: 021-35090100-25 Fax: 021-35090625

SOURCE: PARCO; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.12.2 Parco Business Overview

Founded in 1941, Parco was the first manufacturer to exclusively manufacture O-rings, which are still one of Parco's main products. Today, Parco operates four modern factories producing O-rings, custom molded elastomeric seals, rubber-to-metal bonded parts and machined metal parts. Parco's 154,000-square-foot facility in Ontario, California is one of the largest in the world for molded rubber seals. Parco's three other facilities in Texas and Louisiana specialize in the production of complex custom molded elastomer products, machined metal parts and machined plastics.

Parco has implemented a quality and management system that meets the most stringent standards. In research and development, processing and production, the technology and software are developed that make Parco products the best in the industry. Parco tests each batch of material to verify compliance with its key physical properties. Each molding machine is computer controlled to ensure consistency and optimize productivity.

To maintain the highest quality, Parco manufactures its own molds, develops and mixes compounds, and molds parts in computer-controlled presses. Parco uses video inspection machines to inspect each part for surface defects and dimensional accuracy. Parco's quality management system is certified to international standards ISO 9001 and ISO/TS 16949, as well as aerospace standards AS9100 and AC7115.

In 2018, Parco was acquired by Datwyler Group, a dedicated industrial supplier with leading positions in global and regional markets. Parco is now part of Datwyler's Sealing Solutions division, a leading supplier of custom sealing solutions for demanding industries such as automotive, healthcare and consumer goods. The Datwyler Group is a global company with annual revenues of USD 1.3 billion, 50 operating companies, 8,000 employees and sales in more than 100 countries. The group has been listed on six Swiss exchanges since 1986.

7.12.3 Parco Semiconductor FFKM O-ring Major Product Offerings

Table 80. Parco Semiconductor FFKM O-ring Product Offerings

Product	Feature
Perfluorocarbon (FFKM) O-rings	Parco's perfluoroelastomer (FFKM) O-rings provide an alternative to those made from Kalrez® and similar perfluoroelastomers. FFKM O-rings can be used in continuous temperatures of up to 600°F and resist more chemicals than seals made from other elastomers. Individual FFKM compounds have service temperatures that range from 10 to +600°F.

SOURCE: PARCO AND MARKET MONITOR GLOBAL, INC, 2022

7.12.4 Parco Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 81. Parco Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Parco	2017	2018	2019	2020	2021	2022
Sales	45.83	46.74	40.84	47.18	60.37	62.03
Revenue	5.18	5.14	4.61	5.10	6.82	7.32
Price	113	110	113	108	113	118
Gross Margin	40.92%	42.84%	43.47%	38.78%	42.71%	44.02%

SOURCE: PARCO; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.12.5 Parco Key News

On October 1, 2018, Parco was acquired by the Datwyler Group. With its acquisition of Parco, Datwyler has gained access to several strategically attractive industries for its Sealing Solutions division, particularly oil and gas, aerospace, and water filtration. In addition, Datwyler's acquisition of Parco expands significantly Datwyler's existing O-ring business. In 2015, Datwyler acquired an Italian O-ring manufacturer, Origom. Datwyler's acquisition of Parco will also strengthen Datwyler's presence in the United States.

A family-owned company, Parco is a leading manufacturer of O-rings and custom-molded rubber seals. Like

Datwyler, Parco develops and mixes its own compounds and makes its own molds. With over 75 years' experience, Parco has developed deep relationships with its customers, many of which stretch back decades. The combination of Parco's efficient and automated production processes and industry leading quality have allowed Parco to achieve consistent, profitable growth.

Parco's management team and employees will continue with the business to ensure Parco's customers continue to receive excellent service.

7.13 Parker Hannifin

7.13.1 Parker Hannifin Corporate Summary

Table 82. Parker Hannifin Corporate Summary

Item	Description
■ Company Name	Parker Hannifin
■ Website	https://www.parker.com/
■ Establish Date	1917
■ Semiconductor FFKM O-ring Manufacturing Bases	Americas, Europe, Asia, Africa
■ Sales Regions	Global
■ Headquarters	USA
■ Company Nature	Public
■ Contact Information	Phone: +024288008 Fax: +024804256

SOURCE: PARKER HANNIFIN; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.13.2 Parker Hannifin Business Overview

Parker Hannifin Corporation, originally Parker Appliance Company, usually referred to as just Parker, is an American corporation specializing in motion and control technologies. Its corporate headquarters are in Mayfield Heights, Ohio, in Greater Cleveland (with a Cleveland mailing address).

The company was founded in 1917 and has been publicly traded on the NYSE since December 9, 1964. The firm is one of the largest companies in the world in motion control technologies, including aerospace, climate control, electromechanical, filtration, fluid and gas handling, hydraulics, pneumatics, process control, and sealing and shielding. Parker employs about 58,000 people globally.

7.13.3 Parker Hannifin Semiconductor FFKM O-ring Major Product Offerings

Table 83. Parker Hannifin Semiconductor FFKM O-ring Product Offerings

Product	Feature
FFKM O-Ring	Heat resistance

- Up to 320°C (608°F)

Cold flexibility

- -40°C to -26°C (-40°F to -15°F)

Chemical resistance

- Aliphatic and aromatic hydrocarbons
- Chlorinated hydrocarbons
- Polar solvents (ketones, esters, ethers)
- Inorganic and organic acids
- Water and steam
- High vacuum with minimal loss in weight

Not compatible with:

- Fluorinated refrigerants (R11, 12, 13, 113, 114, etc.)
- Perfluorinated lubricants (PFPE)

SOURCE: PARKER HANNIFIN AND MARKET MONITOR GLOBAL, INC, 2022

7.13.4 Parker Hannifin Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 84. Parker Hannifin Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Parker Hannifin	2017	2018	2019	2020	2021	2022
Sales	18.37	18.65	15.58	17.19	18.35	18.45
Revenue	2.48	2.44	2.07	2.23	2.48	2.51
Price	135	131	133	130	135	136
Gross Margin	44.98%	46.86%	45.55%	43.61%	43.88%	41.61%

SOURCE: PARKER HANNIFIN; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.13.5 Parker Hannifin Key News

Bielefeld, Germany, 24. August 2022- Parker Hannifin, the global leader in motion and control technologies, announces the launch of the new SensoControl® SCPO4 pressure sensor for hydrogen applications.

With this latest development, Parker is following its strategy of engineering products for new markets and future applications. Hydrogen is more and more frequently used in all kinds of transportation equipment: from trucks to buses to trains and marine. In order to enable the production, transportation, fuelling and storage of hydrogen, new products and solutions are necessary. The SCPO4 pressure sensor from Parker has been designed to meet the chemical and physical requirements in the whole hydrogen lifecycle. Here the sensor is especially flexible due to its different threads to match a wide range of system connectors.

The SCP04 offers a high-pressure resistance and, as a digitally calibrated piezoresistive measuring cell, it detects pressures from 4 bar up to 1,000 bar. The special-bonded connection withstands low temperatures, shocks or vibrations, which makes it especially robust for the most demanding environments.

A monolithic design removes the need for internal seals and eliminates leakage due to material fatigue. The SCP04 has no pressure transfer fluid and no large, pressurized areas. It is also vacuum-tight and elastomer-free. The process connections have been designed to be gasket-free to meet the requirements of hydrogen applications.

The SCP04's robust construction from 316L stainless-steel and low permeability result in a wide media resistance and prevent embrittlement of the metal by ionized hydrogen. Besides that, the sensor offers a high connectivity through high compatibility with different available connectors and can be configured with various output signals.

7.14 CTG

7.14.1 CTG Corporate Summary

Table 85. CTG Corporate Summary

Item	Description
■ Company Name	CTG
■ Website	https://www.ctgasket.com/
■ Establish Date	1984
■ Semiconductor FFKM O-ring Manufacturing Bases	USA
■ Sales Regions	North America
■ Headquarters	USA
■ Company Nature	Public
■ Contact Information	Tel: 800.299.1685 Email: ctgsales@ctgasket.com

SOURCE: CTG; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.14.2 CTG Business Overview

When designing custom Ffkm O-rings, CTG, Inc. employees assist customers through the complete lifecycle of customer input and design, prototyping (optional), tool/mold production, and production. CTG, Inc. can also advise on seal modifications to the assembly design, which will aid in installation, cleaning and repair.

CTG, Inc.'s ability to manufacture, source, package and ship parts on time, even in an emergency, makes CTG, Inc. a one-stop shop for sealing solutions.

In addition to Ffkm O-rings, CTG, Inc. specializes in Oil & Gas Seals, Viton Seals, Kalrez Seals, Custom Seals, High Temperature Seals, Viton Molding, FFKM Molding, PEEK Molding, PTFE Molding, 3D Printing and Many other high-performance products and services detailed on our website.

CTG, Inc. products and services have been the first choice for chemical, oil and gas, semiconductor, pulp and paper, medical, industrial, R&D, OEM, and more.

In an economy that needs to balance inventory and production, it can be difficult to prepare when unforeseen problems lead to equipment failures, power outages or excess capacity. CTG, Inc. helps you avoid lost production. CTG, Inc. works around the clock to get your Ffkm O-rings done quickly while maintaining high standards in quality and precision.

7.14.3 CTG Semiconductor FFKM O-ring Major Product Offerings

Table 86. CTG Semiconductor FFKM O-ring Product Offerings

Product	Feature
FFKM O-RINGS	Highly resistant to many chemicals, and outstanding resistance to high temperatures.

SOURCE: CTG AND MARKET MONITOR GLOBAL, INC, 2022

7.14.4 CTG Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 87. CTG Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

CTG	2017	2018	2019	2020	2021	2022
Sales	18.31	18.61	16.14	18.25	18.84	19.29
Revenue	1.70	1.66	1.45	1.59	1.71	1.79
Price	93	89	90	87	91	93
Gross Margin	42.16%	43.41%	40.97%	40.04%	40.01%	38.45%

SOURCE: CTG; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.14.5 CTG Key News

CTG doesn't have representative development recently.

7.15 Ningbo Sunshine Sealing Technology Co., Ltd

7.15.1 Ningbo Sunshine Sealing Technology Co., Ltd Corporate Summary

Table 88. Ningbo Sunshine Sealing Technology Co., Ltd Corporate Summary

Item	Description
■ Company Name	Ningbo Sunshine Sealing Technology Co., Ltd
■ Website	https://www.sunshinegaskets.com/
■ Establish Date	2006
■ Semiconductor FFKM O-ring Manufacturing Bases	China
■ Sales Regions	Global
■ Headquarters	China
■ Company Nature	Private
■ Contact Information	EMAIL: sunshine@sunshinegaskets.com FAX: 0086-0574-55121571

SOURCE: NINGBO SUNSHINE SEALING TECHNOLOGY CO., LTD; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

7.15.2 Ningbo Sunshine Sealing Technology Co., Ltd Business Overview

After 15 years of development, Ningbo Sunshine Sealing Technology Co., Ltd. has a complete production line of industrial sealing products and other high-performance materials, including industrial sealing gaskets such as non-metallic and metal gaskets, compression braided gland packing, flange insulation gasket kits , Various high-performance rubber and plastic products, insulation products, various gasket machines and equipment for braided gland packing. As a result, many different industries can be served, such as oil and gas, chemical plants, petrochemicals, mining, electronics, power plants, food, cement industry, pharmaceuticals, automotive industry, pipe and boiler manufacturers and other key industries.

7.15.3 Ningbo Sunshine Sealing Technology Co., Ltd Semiconductor FFKM O-ring Major Product Offerings

Table 89. Ningbo Sunshine Sealing Technology Co., Ltd Semiconductor FFKM O-ring Product Offerings

Product	Feature
1. Chemical resistance compound FFKM O-rings series	Sunraz™ Perfluoroelastomer FFKM o-rings are the best high-performance group of rubber o-rings together with the maximum temperatures (up to 330°C) as well as best chemical resistance. FFKM o-rings are specifically created for extraordinary purposes where up time efficiency is worth the significantly higher cost in comparison with additional standard rubber products.
2. High temperature	Ningbo Sunshine Sealing Technology Co., Ltd

resistance compound FFKM O-rings range offers common FFKM O-rings in AS-568, JIS B2401, JIS P, JIS V, JIS G, JIS S and global metric.

3.High purity FFKM series

SOURCE: NINGBO SUNSHINE SEALING TECHNOLOGY CO., LTD AND MARKET MONITOR GLOBAL, INC, 2022

7.15.4 Ningbo Sunshine Sealing Technology Co., Ltd Semiconductor FFKM O-ring Sales and Revenue in Global (2017-2022)

Table 90. Ningbo Sunshine Sealing Technology Co., Ltd Semiconductor FFKM O-ring Sales (K Pcs), Revenue (US\$, Mn) and Average Price (US\$/Pcs) & (2017-2022)

Ningbo Sunshine Sealing Technology Co., Ltd	2017	2018	2019	2020	2021	2022
Sales	18.02	18.87	16.21	18.12	19.03	18.92
Revenue	0.99	1.02	0.89	0.96	1.01	1.04
Price	55	54	55	53	53	55
Gross Margin	39.01%	39.24%	39.19%	36.29%	38.24%	38.48%

SOURCE: NINGBO SUNSHINE SEALING TECHNOLOGY CO., LTD; SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

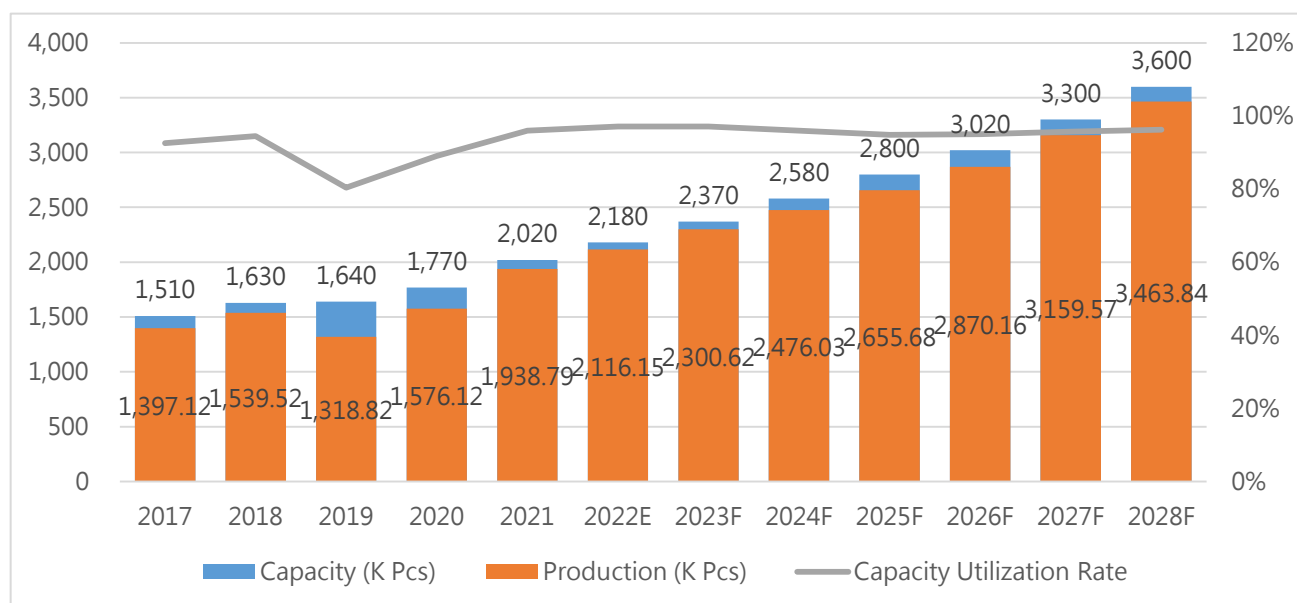
7.15.5 Ningbo Sunshine Sealing Technology Co., Ltd Key News

Ningbo Sunshine Sealing Technology Co., Ltd doesn't have representative development recently.

8 Global Semiconductor FFKM O-ring Production Capacity, Analysis

8.1 Global Semiconductor FFKM O-ring Production Capacity, 2017-2028

Figure 34. Global Semiconductor FFKM O-ring Production Capacity (K Pcs), 2017-2028



SOURCE: SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

8.2 Semiconductor FFKM O-ring Production Capacity of Key Manufacturers in Global Market

Table 91. Semiconductor FFKM O-ring Capacity of Key Manufacturers in Global Market, 2020-2022 (K Pcs)

Quantity (K Pcs)	2020	2021	2022
DuPont	250	280	310
Greene Tweed	130	150	160
Trelleborg	120	140	150
Freudenberg	110	120	130
TRP Polymer Solutions	110	130	140
Gapi	130	150	160
Maxmold Polymer	70	80	90
Yoson Seals	180	210	230
Precision Polymer Engineering (PPE)	100	110	120

Fluorez Technology	110	130	140
Applied Seals	90	100	110
Parco (Datwyler)	50	60	60
Parker Hannifin	20	20	20
CTG	20	20	20
Ningbo Sunshine	20	20	20
Other Companies	260	300	320
Total	1,770	2,020	2,180

SOURCE: ABOVE COMPANIES AND MARKET MONITOR GLOBAL, INC, 2022

Table 92. Global Semiconductor FFKM O-ring Capacity Market Share of Key Manufacturers, 2020-2022

Company	2020	2021	2022
DuPont	14.12%	13.86%	14.22%
Greene Tweed	7.34%	7.43%	7.34%
Trelleborg	6.78%	6.93%	6.88%
Freudenberg	6.21%	5.94%	5.96%
TRP Polymer Solutions	6.21%	6.44%	6.42%
Gapi	7.34%	7.43%	7.34%
Maxmold Polymer	3.95%	3.96%	4.13%
Yoson Seals	10.17%	10.40%	10.55%
Precision Polymer Engineering (PPE)	5.65%	5.45%	5.50%
Fluorez Technology	6.21%	6.44%	6.42%
Applied Seals	5.08%	4.95%	5.05%
Parco (Datwyler)	2.82%	2.97%	2.75%
Parker Hannifin	1.13%	0.99%	0.92%
CTG	1.13%	0.99%	0.92%
Ningbo Sunshine	1.13%	0.99%	0.92%
Other Companies	14.69%	14.85%	14.68%
Total	100%	100%	100%

SOURCE: ABOVE COMPANIES AND MARKET MONITOR GLOBAL, INC, 2022

8.3 Global Semiconductor FFKM O-ring Production by Region

Table 93. Global Semiconductor FFKM O-ring Production by Region, 2017-2022 (K Pcs)

Global	2017	2018	2019	2020	2021	2022
North America	266.82	277.68	235.28	287.14	351.65	378.31

Europe	493.67	550.83	471.22	570.56	686.87	746.18
China Mainland	185.19	207.54	174.84	191.45	253.56	277.53
Taiwan	379.14	420.08	368.43	441.22	543.74	600.24
Rest of World	72.30	83.39	69.05	85.75	102.97	113.89
Total	1,397.12	1,539.52	1,318.82	1,576.12	1,938.79	2,116.15

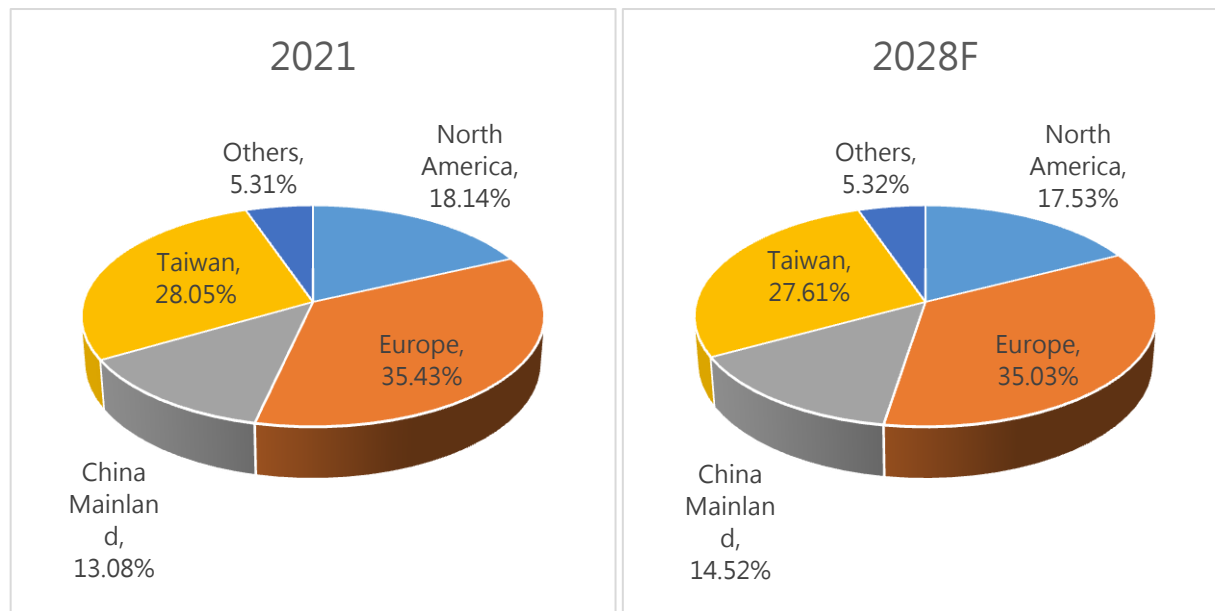
SOURCE: SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

Table 94. Global Semiconductor FFKM O-ring Production by Region, 2023-2028 (K Pcs)

Global	2023	2024	2025	2026	2027	2028
North America	409.57	436.63	479.47	518.48	561.74	607.20
Europe	796.55	871.79	923.71	995.20	1,102.19	1,213.32
China Mainland	311.16	336.76	366.85	408.49	455.66	502.82
Taiwan	658.35	697.05	738.20	785.87	868.16	956.36
Rest of World	124.99	133.80	147.45	162.12	171.82	184.14
Total	2,300.62	2,476.03	2,655.68	2,870.16	3,159.57	3,463.84

SOURCE: SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

Figure 35. The Percentage of Production Semiconductor FFKM O-ring by Region, 2021 VS 2028



SOURCE: SECONDARY LITERATURE, PRESS RELEASES AND MARKET MONITOR GLOBAL, INC, 2022

9 Key Market Trends, Opportunity, Drivers and Restraints

9.1 Market Opportunities & Trends

Table 95. Semiconductor FFKM O-ring Market Opportunities & Trends in Global Market

Increased competition	The competition among vendors will increase during the forecast period. Vendors will compete to deliver competitive advantages in the market on the basis of pricing, user-friendly interfaces, value-added benefits, and service portfolios. During the forecast period, we expect this competition to intensify with an increase in product extensions.
Continuous innovation	Technological innovations have an important role in driving the growth of the market. To sustain in the competitive market, vendors should develop new ideas and technologies and stay up-to-date with the advanced technologies.
Increasing demand	In view of the growing development of semiconductor and petrochemical industries and other industries, the demand for FFKM O-ring will also increase rapidly.

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

9.2 Market Drivers

Table 96. Semiconductor FFKM O-ring Market Drivers in Global Market

Semiconductor FFKM O-rings resist over 1,800 different chemicals while providing high temperature stability. FFKM O-rings are widely used in highly corrosive chemical processing, semiconductor wafer fabrication, pharmaceutical, oil and gas recovery, and aerospace applications.

The unique properties of FFKM O-rings' materials are ideal for demanding sealing applications, helping to maintain high-quality part sealing integrity, thereby reducing maintenance, operating costs and improving safety.

The semiconductor market is expected to grow significantly as the demands increase in the automobile, energy, and medical fields as well as IoT and DX advances. Semiconductor manufacturing equipment, which underpins the growth, are required to develop at an accelerating pace in order to keep up with the diversified needs in applications and manufacturing processes.

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

9.3 Market Restraints

Table 97. Semiconductor FFKM O-ring Market Restraints in Global Market

The price is high, and it has always been used in a more severe environment.

Poor cold temperature performance. Poor abrasion resistance.

FFKM is not suitable for every application. For example, it must be taken into account that the material

does not work optimally at low temperatures.

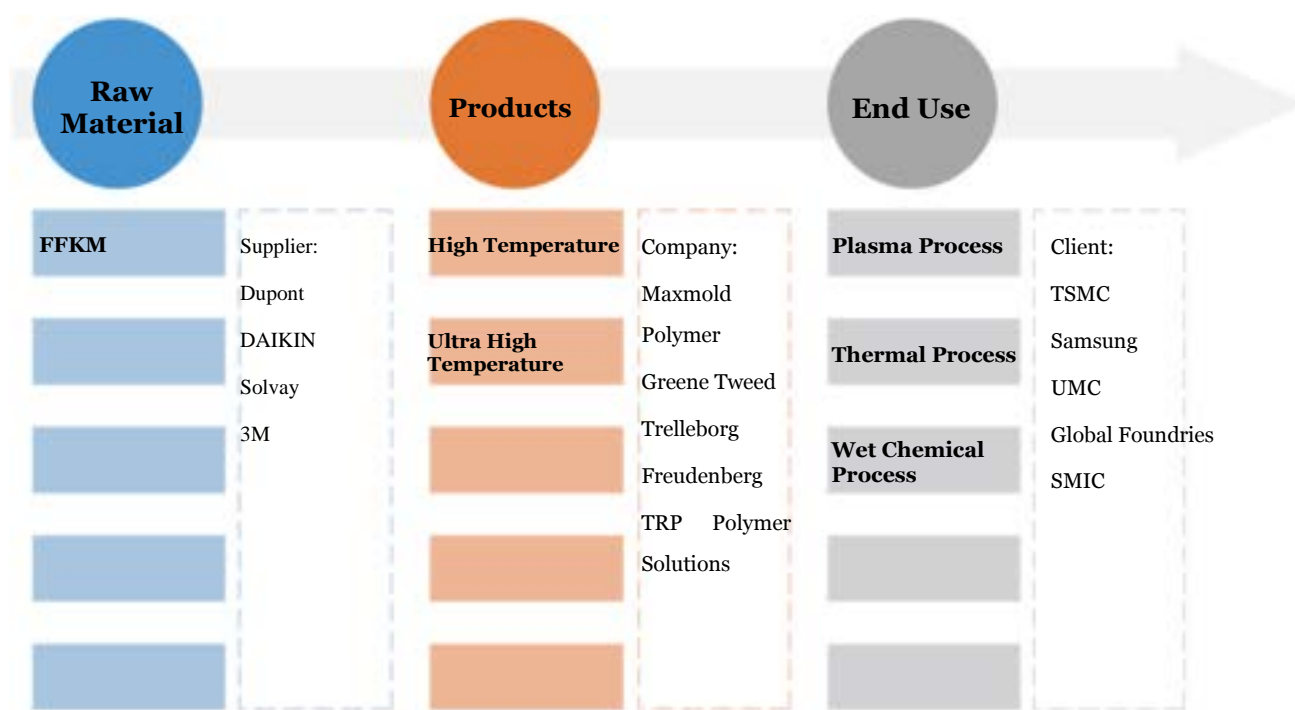
Global economic growth slowed. The world economic situation is not optimistic. Many countries have slow growth or even negative growth, which has delayed the development of the industry to a certain extent.

SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

10 Semiconductor FFKM O-ring Supply Chain Analysis

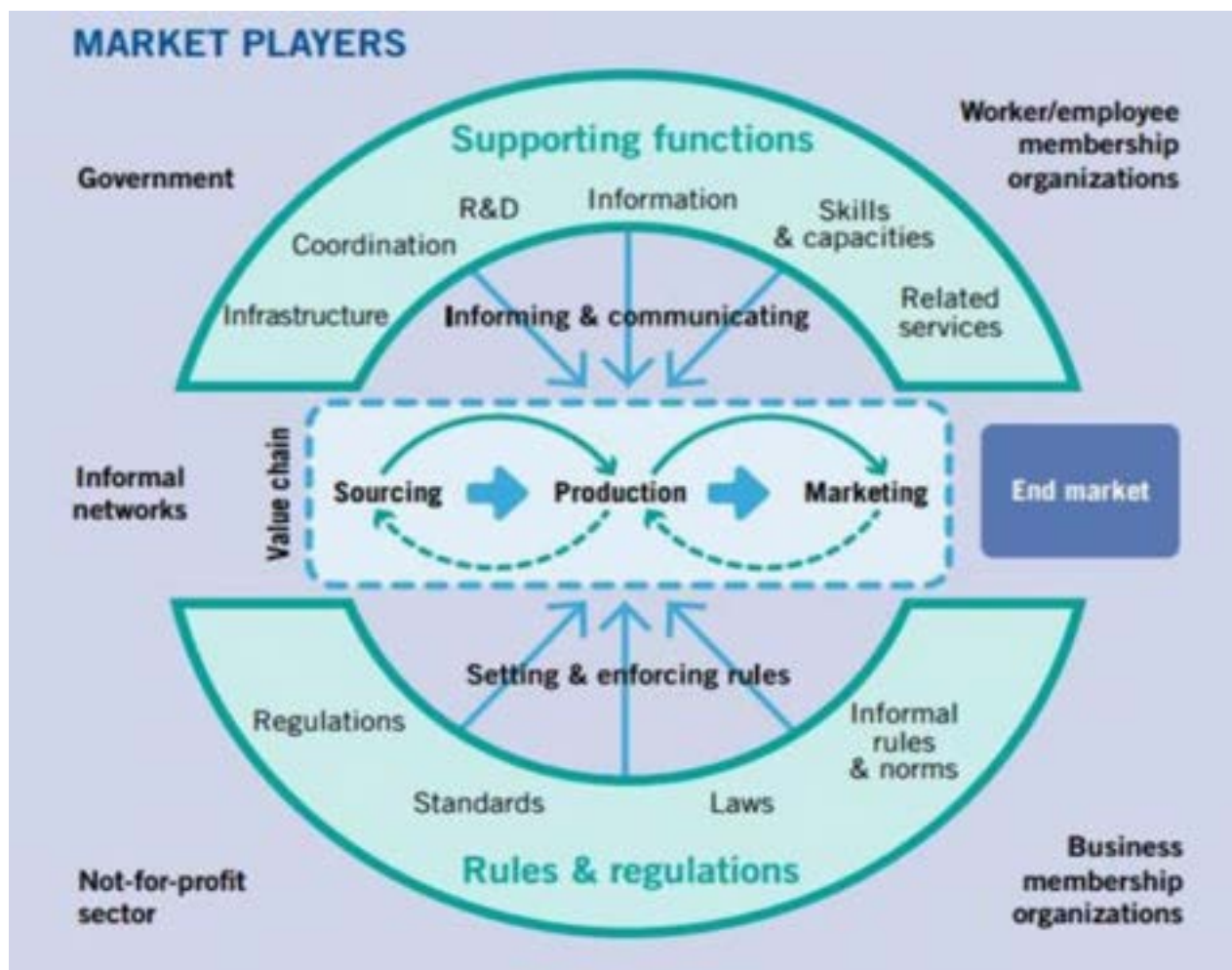
10.1 Semiconductor FFKM O-ring Industry Value Chain

Figure 36. Semiconductor FFKM O-ring Industry Value Chain



SOURCE: SECONDARY SOURCES AND MARKET MONITOR GLOBAL, INC, 2022

The term Value Chain refers to the fact that value is added to preliminary products through the combination of other resources (for example tools, manpower, knowledge and skills, other raw materials or preliminary products). As the product passes through several stages of the value chain, the value of the product increases. The figure below (from the manual) sketches the value chain approach and aspects to be considered:



10.2 Semiconductor FFKM O-ring Upstream Market

Table 98. Semiconductor FFKM O-ring Raw Materials

Top Impacts	Description
Price	The price is high, and it has always been used in a more severe environment.
Properties	FFKM swells significantly in fluorinated solvents and cannot be used with molten or gaseous alkali metals.

SOURCE: SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

Table 99. Semiconductor FFKM O-ring Raw Materials Suppliers in Global Market

Company	Headquarters	Website
DuPont	USA	https://www.dupont.com/
DAIKIN	Japan	https://www.daikin.com/
Solvay	Belgium	https://www.solvay.com/en/
3M	USA	https://www.3m.com/

SOURCE: SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

10.3 Semiconductor FFKM O-ring Downstream and Clients

Table 100. Typical Semiconductor FFKM O-ring Downstream

Downstream	Description
Semiconductor fabrication plants	FFKM O-rings enhance the corrosion resistance of semiconductor equipment seals, preventing post-use breakage and delamination, thereby improving semiconductor process stability.

SOURCE: SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

Table 101. Semiconductor FFKM O-ring Downstream Clients in Global Market

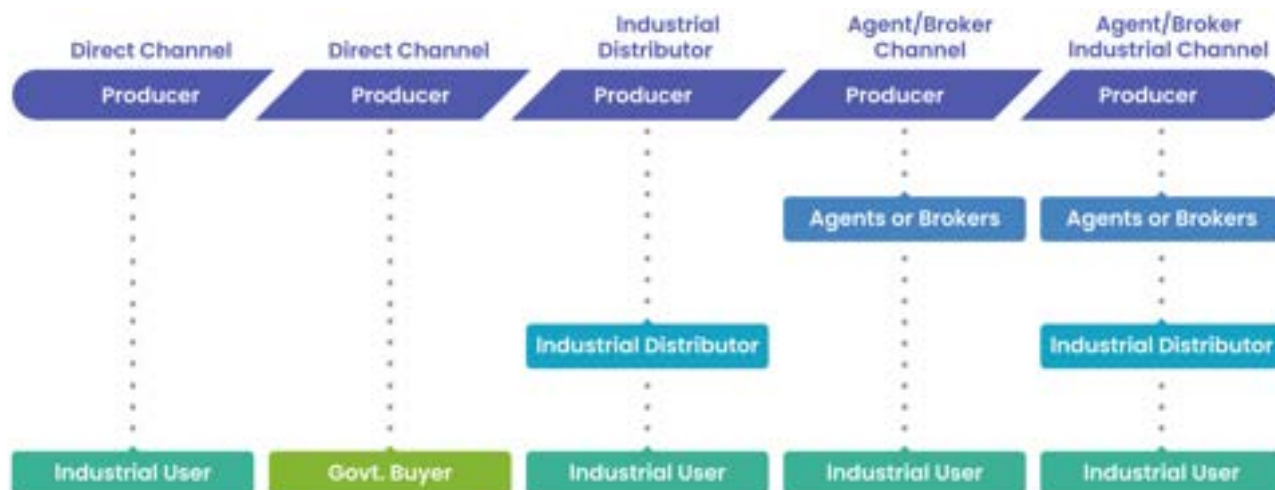
Clients	Headquarters	Website
Samsung	South Korea	https://www.samsung.com/
UMC	Taiwan	https://www.umc.com/
GlobalFoundries	United States	https://gf.com/zh/
SMIC	China	https://www.smics.com/en/
Huahong Group	China	https://www.huahong.com
Powerchip	Taiwan	https://www.powerchip.com/
VIS	Taiwan	https://www.vis.com.tw/
Nexchip	China	https://en.nexchip.com.cn/
Tower Semiconductor	Israel	https://towersemi.com/
Infineon	Germany	https://www.infineon.com/
Intel	United States	https://www.intel.com/
STMicroelectronics	Switzerland	https://www.st.com/
NXP	Netherlands	https://www.nxp.com/

SOURCE: ABOVE COMPANIES AND SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

10.4 Marketing Channels Analysis

10.4.1 Marketing Channels

Figure 37. Marketing Channels



SOURCE: SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

10.4.2 Semiconductor FFKM O-ring Distributors and Sales Agents in Global

Table 102. Semiconductor FFKM O-ring Distributors and Sales Agents in Global Market

Company	Headquarters	Website
Seal & Design Inc.	USA	https://www.sealanddesign.com/
M.Barnwell Services Limited.	UK	https://www.barnwell.co.uk/
MFPSeals	USA	https://www.mfpseals.com/

SOURCE: ABOVE COMPANIES AND SECONDARY SOURCES, EXPERT INTERVIEWS AND MARKET MONITOR GLOBAL, INC, 2022

11 Conclusion

FFKM O-Rings for Semiconductor Manufacturing: FFKM leads to a more reliable, long-lasting o-ring life, which also reduces maintenance requirements and reduces equipment downtime. The use of FFKM, in particular, reduces process contamination which results in better product quality and greater yield.

1. Market Size

Global Semiconductor FFKM O-ring market size in terms of revenue is projected to reach 346.13 Million USD by 2028 from 212.55 Million USD in 2022, with a CAGR 8.47% during 2022-2028. Global Semiconductor FFKM O-ring market size in terms of sales is projected to reach 3,463.84 K Pcs by 2028 from 2,116.15 K Pcs in 2022, with a CAGR 8.56% during 2022-2028.

2. Competition

The representative players in global Semiconductor FFKM O-ring market are DuPont, Greene Tweed, Trelleborg, TRP Polymer Solutions and Gapi, accounting for 46.68% market share in terms of revenues in 2021. The market concentration rate is high. Players are concentrated in United States, Europe and China.

3. Regions Comparison

The representative production regions in this market are United States, Europe and China, with more than 70% market share in 2021 and representative consumption regions are North America, Europe and Asia-Pacific, with 98.39% market share in 2022.

4. Product Classification

Semiconductor FFKM O-ring mainly includes High Temperature ($\leq 300^{\circ}\text{C}$), Extreme High Temperature ($> 300^{\circ}\text{C}$) resistance range. High Temperature accounts for 68.57% market share in terms of sales/revenues in 2021.

5. Downstream Market

Semiconductor FFKM O-ring is mainly used in Plasma Process, Thermal Treatment, Wet Chemical Process. The representative application is Thermal Treatment, accounting for 39.34% market share in terms of sales in 2021.

6. Price

The price of Semiconductor FFKM O-ring differs from company to company, as there is a great difference in terms of raw material, size, quality, and application, etc. The average price is increasing yearly in general, for the raw material price and labor cost etc combined factors.

12 Appendix

12.1 Note

- This table of contents (TOC) is tentative and is subject to further refinement during the course of the research
- Enlisted companies represent partial list of market participants. Profiles of specific companies if required, shall be added to the report upon request
- Company figures and market share is subject to companies reporting sales in public domain and data availability through primary interviews
- Market segmentation or taxonomy is tentative and is subject to change upon further detailed analysis of the target market
- Country level coverage in key regions subject to change as per market dynamics in respective regions

12.2 Examples of Clients



12.3 Disclaimer

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