

RESEARCH REPORT

NOTE: This document is a free excerpt of a larger research report. If you are interested in purchasing the full report, please contact Tractica at sales@tractica.com.

EXECUTIVE SUMMARY

Wearable Devices for Enterprise and Industrial Markets

Smart Watches, Fitness Trackers, Body Sensors, Smart Glasses, Smart Clothing, Wearable Cameras, and Other Wearables for Commercial and Workplace Applications: Global Market Analysis and Forecasts

Published 2Q 2016

ADITYA KAUL
Research Director

CLINT WHEELOCK
Managing Director

SECTION 1

EXECUTIVE SUMMARY

1.1 INTRODUCTION

Wearables in enterprise and industrial environments continue to see high levels of interest and market momentum, as companies across a wide variety of industry sectors conduct trials with a diverse set of devices across multiple use cases. In terms of unit volumes and revenue, enterprise and industrial wearables are still a very small portion of the overall market, although their share of the total market is expected to grow over time.

Tractica differentiates between enterprise and industrial wearables to highlight the differences in the types of use cases and the value propositions being offered. Enterprise wearables are generally those devices used in a corporate setting, while industrial wearables are typically used in non-corporate, manufacturing, field service, or shop floor environments.

This 2016 update to Tractica's enterprise and industrial wearables research highlights the latest trends in enterprise and industrial wearables activity since our first report on the subject was published in 2015. Compared to 2015, the market is moving into a quieter phase, with the focus shifting from public announcements to the hard work that needs to be done behind the scenes to get wearables rolled out at commercial scale. Fitness trackers are seeing large-scale adoption in corporate wellness programs, smart glasses are continuing to experience a growth in trial activity with pilots converting to commercial deployments, and smart watches like the Apple Watch are beginning to gain greater attention from enterprise-focused app developers. Innovative new use cases are also emerging, including such diverse examples as wearable cameras in retail settings, smart glasses as an omnichannel sales enabler, and baseball caps being used to track fatigue of workers at mining sites. This Tractica report covers the market for enterprise and industrial wearables, providing comprehensive coverage of the various wearable device types, their specific roles, and adoption timelines in the workplace. The devices covered include smart watches, smart glasses, fitness trackers, smart clothing, body sensors, wearable cameras, and other wearables. The report also includes market sizing and forecasts from 2015 through 2021, providing shipments and revenue, while segmenting the market by device type, region, enterprise, and industrial use cases.

1.2 MARKET DRIVERS

The market for enterprise and industrial wearables has a number of adoption and growth drivers as outlined below.

Corporate wellness remains the top driver for enterprise wearables, with companies deploying fitness trackers and smart watches to help employees stay healthy and remain productive. During the course of 2015, there was significant growth in the number of companies implementing corporate wellness programs. Fitness tracker company Fitbit has reported adding 1,000 companies in 2015 to its corporate wellness program, while digital health platform company Jiff reported that its customer base grew by 500% in the same period. While concerns around data privacy, security and employer intentions remain, in the majority of cases these programs have been received positively and are expanding.

Workplace distraction is an issue, with social media being one of the top mobile applications in the workplace. At the same time, the recent rise of app-based notifications makes the

smartphone a leading cause of distraction in the workplace. Rather than unlocking and opening your smartphone every time you get a notification, and be distracted by something else on the screen, smart watches allow notifications to be received with quick glances or swipes on your wrist. By adding contextual information such as time of day, location, or calendar, these notifications can be further filtered. There is also a case for smart glasses like Microsoft HoloLens providing distraction-free workspaces by eliminating distractions, thereby improving productivity.

In industrial settings, both on the shop floor and in the field, the ability for workers to have hands-free capability is a highly valuable resource. Smart glasses and smart headsets are invaluable in providing workers the necessary information in front of their eyes, or in the ears. Voice inputs or hand gestures can enhance that capability, allowing them to control the interface and device, while at the same time focusing on the task at hand. This is the key reason that wearables are now seen as ideal replacements for bulky handheld devices like PDAs, tablets, and laptops.

Apart from providing hands-free capabilities, wearables can also help improve industrial workflows, impacting the cost and delivery of the product or service. Smart glasses are being utilized to replace paper-based instructions and provide virtual guidebooks for tasks, even providing live videoconferencing capabilities to enable remote assistance. Wearable cameras can also provide similar capabilities in terms of capturing first-person views of remote workers to aid sales associates in retail stores.

1.3

MARKET BARRIERS

A number of drivers exist for the growing adoption of enterprise and industrial wearables. However, a few key barriers pose a risk to market growth.

Up to this point, we have not yet seen any misuse of employee data that is generated through corporate wellness programs. However, it is only a matter of time before this happens, and if you are an employee participating in one of these programs, it would be prudent to check the data and privacy protection laws in your state or country, as well as the policies of your provider. Fitbit recently declared that all of the data collected on its trackers are Health Insurance Portability and Accountability Act (HIPAA)-compliant, but at the same time it is not clear if Apple will ever provide HIPAA protection for its Apple Watch health data. There are also no clear policies or laws governing the data once an employee has left a company. The unclear nature of the policies regarding data privacy and protection with corporate wellness could have an impact on getting new employees to sign up.

Google Glass faced a lot of criticism for its poor social acceptability, which was a function of its design and form factor that included a camera attached to the face of the glass, which led to many people feeling threatened. Although this is less likely to be a concern in an industrial or enterprise setting, in a customer-facing setting such as retail or hospitality it could lead to problems and customer resistance. Some employers, such as the insurance provider USAA, have banned Google Glass from their premises as a result of these concerns.

The oil and gas industry and the mining industry operate in extremely hazardous environments, with strict fire, health, and safety rules. Any device that is approved for use on hazardous sites like an oil rig needs to undergo testing and industry standards classification. In addition, the personnel operating devices at these sites need to be certified. All of these extra certifications take time, which can lead to delays in the rollout of wearables in these markets.

1.4**KEY APPLICATION AREAS**

Tractica sees enterprise and industrial wearables being used today and in the coming years in the following key application areas:

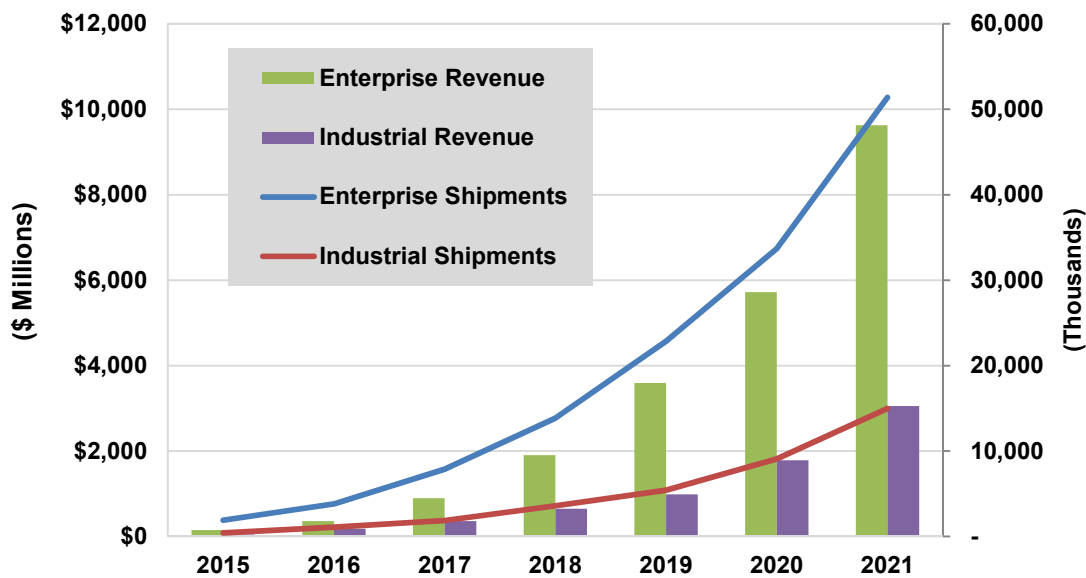
- Corporate Wellness Programs
- Warehouse/Logistics Applications
- Manufacturing Shop Floor Inspection
- Fatigue Management
- Workflow Improvement
- 3D/Holographic Modeling for Engineering, Design, or Architectural Firms
- Authentication in the Workplace
- Field Services, Remote Monitoring, and Assistance
- Retail and Customer Service

1.5 MARKET FORECAST

Tractica forecasts that total shipments for enterprise and industrial wearable devices will grow from 2.3 million units in 2015 to 66.4 million by 2021, with enterprise wearables making up the majority of the share to begin with, but industrial wearables growing their share as the years progress. The total device revenue for enterprise and industrial wearables will grow from \$198.45 million in 2015 to \$12.68 billion in 2021.

As a percentage of the total wearables market, enterprise and industrial wearables will grow from having a 3% share of shipments in 2015 to a 12% share by 2021. In terms of revenue, the share will grow from 2% in 2015 to 13% by 2021.

Chart 1.1 *Enterprise and Industrial Wearable Shipments and Revenue, World Markets: 2015-2021*



(Source: Tractica)

SECTION 8

TABLE OF CONTENTS

SECTION 1	1
Executive Summary	1
1.1 Introduction.....	1
1.2 Market Drivers	1
1.3 Market Barriers.....	2
1.4 Key Application Areas	3
1.5 Market Forecast	4
SECTION 2	5
MARKET ISSUES	5
2.1 Definitions.....	5
2.2 Market Drivers	5
2.2.1 Tracking Workplace Wellness Will Be the Norm.....	6
2.2.2 Smartphones Can Be a Distraction at Work	6
2.2.3 Notifications When Done Right Are Highly Valuable.....	7
2.2.4 Hands-Free Is a Valuable Resource for Workplace Applications	7
2.2.5 Wearables Can Improve Industrial Workflows	8
2.2.6 First-Person View Will Benefit Workplace Communications	8
2.3 Market Barriers.....	8
2.3.1 Data Privacy and Security in the Workplace	8
2.3.2 Invisibility of Wearables Is a Factor in Customer-Facing Applications.....	9
2.3.3 Prohibitive Workplace Policies against Wearables	10
2.3.4 Hardware’s Intrinsic Safety Requirements	10
2.4 Key Device Types	11
2.5 Key Application Areas	12
2.6 Business Models and Value Chains	14
SECTION 3	16
Technology Issues	16
3.1 Bring Your Own Wearable and Its Enterprise Implications.....	16
3.1.1 BYOW Is Unlikely to Change the Role of Enterprise IT	16
3.1.2 Smart Watches Will Be the Main BYOW.....	16
3.1.3 BYOW and Corporate Wellness Will Go Hand in Hand.....	17
3.2 Mixed Reality: The Next Enterprise Computing Platform	17
3.3 UI for Enterprise Wearables: Gesture, Voice, and Holograms	19
3.3.1 Gesture Control	20
3.3.2 Voice Control.....	20
3.3.3 Holographic Interfaces	21
3.4 Can Wearables Replace Mobile Workforce Computers?	22
3.5 Authentication in the Workplace.....	24
SECTION 4	25
Key Industry Players	25
4.1 Apple	25
4.2 APX Labs	26
4.3 Augmate	26
4.4 DAQRI	26
4.5 Epson	28
4.6 Fitbit.....	28
4.7 Google.....	29

4.8	Jiff.....	30
4.9	Microsoft.....	30
4.10	Nymi.....	32
4.11	Salesforce.com.....	32
4.12	SAP.....	34
4.13	SmartCap.....	34
4.14	Thalmic Labs.....	35
4.15	Vuzix.....	36
SECTION 5.....		38
Market Forecasts.....		38
5.1	Definitions and Assumptions.....	38
5.2	2016 Update And Total Market.....	39
5.3	Smart Watches.....	47
5.4	Smart Glasses.....	52
5.5	Fitness Bands.....	55
5.6	Smart Clothing.....	60
5.7	Body Sensors.....	64
5.8	Wearable Cameras.....	68
5.9	Other Wearables.....	72
5.10	Conclusions and Recommendations.....	75
SECTION 6.....		77
Company Directory.....		77
SECTION 7.....		79
Acronym and Abbreviation List.....		79
SECTION 8.....		81
Table of Contents.....		81
SECTION 9.....		83
Table of Charts and Figures.....		83
SECTION 10.....		86
Scope of Study.....		86
Sources and Methodology.....		86
Notes.....		87

SECTION 9

TABLE OF CHARTS AND FIGURES

Chart 1.1	Enterprise and Industrial Wearable Shipments and Revenue, World Markets: 2015-2021... 4	4
Chart 5.1	Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	40
Chart 5.2	Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021.....	41
Chart 5.3	Enterprise and Industrial Wearable Revenues versus Total Wearables Market, World Markets: 2015-2021	42
Chart 5.4	Enterprise and Industrial Wearable Device Shipments by Device Type, World Markets: 2015-2021	43
Chart 5.5	Enterprise and Industrial Wearable Device Revenue by Device Type, World Markets: 2015-2021	44
Chart 5.6	Enterprise and Industrial Wearable Revenue Share as a Percentage of Total Market by Device Type, World Markets: 2015-2021	45
Chart 5.7	Enterprise and Industrial Wearable Device Shipments by Region, World Markets: 2015-2021	46
Chart 5.8	Enterprise and Industrial Wearable Device Revenue by Region, World Markets: 2015-2021	47
Chart 5.9	Smart Watches Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	48
Chart 5.10	Smart Watches Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	49
Chart 5.11	Smart Watches Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	49
Chart 5.12	Smart Watches Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	50
Chart 5.13	Smart Watches Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	51
Chart 5.14	Smart Watches Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	51
Chart 5.15	Smart Glasses Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	52
Chart 5.16	Smart Glasses Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	53
Chart 5.17	Smart Glasses Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	53
Chart 5.18	Smart Glasses Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	54
Chart 5.19	Smart Glasses Enterprise and Industrial Wearable Device Shipments by Region, World Markets: 2015-2021	54
Chart 5.20	Smart Glasses Enterprise and Industrial Wearable Device Revenue by Region, World Markets: 2015-2021	55
Chart 5.21	Fitness Bands Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	55
Chart 5.22	Fitness Bands Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	56
Chart 5.23	Fitness Bands Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	57
Chart 5.24	Fitness Bands Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	57

Chart 5.25	Fitness Bands Enterprise and Industrial Wearable Device Shipments by Region, World Markets: 2015-2021	58
Chart 5.26	Fitness Bands Enterprise and Industrial Wearable Device Revenue by Region, World Markets: 2015-2021	59
Chart 5.27	Smart Clothing Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	60
Chart 5.28	Smart Clothing Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	61
Chart 5.29	Smart Clothing Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	62
Chart 5.30	Smart Clothing Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	62
Chart 5.31	Smart Clothing Enterprise and Industrial Wearable Device Shipments by Region, World Markets: 2015-2021	63
Chart 5.32	Smart Clothing Enterprise and Industrial Wearable Device Revenue by Region, World Markets: 2015-2021	63
Chart 5.33	Body Sensors Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	64
Chart 5.34	Body Sensors Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	65
Chart 5.35	Body Sensors Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	66
Chart 5.36	Body Sensors Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	66
Chart 5.37	Body Sensors Enterprise and Industrial Wearable Device Shipments by Region, World Markets: 2015-2021	67
Chart 5.38	Body Sensors Enterprise and Industrial Wearable Device Revenue by Region, World Markets: 2015-2021	67
Chart 5.39	Wearable Cameras Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	68
Chart 5.40	Wearable Cameras Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	69
Chart 5.41	Wearable Cameras Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	70
Chart 5.42	Wearable Cameras Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	70
Chart 5.43	Wearable Cameras Enterprise and Industrial Wearable Device Shipments by Region, World Markets: 2015-2021	71
Chart 5.44	Wearable Cameras Enterprise and Industrial Wearable Device Revenue by Region, World Markets: 2015-2021	71
Chart 5.45	Other Wearables Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	72
Chart 5.46	Other Wearables Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	73
Chart 5.47	Other Wearables Enterprise and Industrial Wearable Device Shipments, World Markets: 2015-2021	73
Chart 5.48	Other Wearables Enterprise and Industrial Wearable Device Revenue, World Markets: 2015-2021	74
Chart 5.49	Other Wearables Enterprise and Industrial Wearable Device Shipments by Region, World Markets: 2015-2021	74
Chart 5.50	Other Wearables Enterprise and Industrial Wearable Device Revenue by Region, World Markets: 2015-2021	75
Chart 10.1	Tractica Research Methodology.....	87

Figure 2.1	Benefits of Wearables in the Workplace	5
Figure 2.2	Time Taken to Respond to Mobile Notifications.....	7
Figure 2.3	Virgin Atlantic's Trial of Google Glass.....	10
Figure 2.4	Enterprise and Industrial Wearable Value Chain	15
Figure 3.1	Market Share Held by the Leading Computer OSES, World Markets: 2012-2014	18
Figure 3.2	Smartphone versus PC	19
Figure 3.3	Gesture Control for Construction Worker Application	20
Figure 3.4	Voice Control for Smart Glasses Application on Manufacturing Shop Floor	21
Figure 3.5	Holoportation on Microsoft HoloLens	22
Figure 3.6	Examples of Traditional Mobile Workforce Computers.....	23
Figure 4.1	DAQRI Smart Helmet.....	27
Figure 4.2	Google Glass Enterprise Edition	29
Figure 4.3	Microsoft HoloLens Enterprise Application - Volvo	31
Figure 4.4	Salesforce Wear – Apple Watch Analytics Application	33
Figure 4.5	SAP Glass Challenge 2015 Winner – Reply Smart PoS Category Management.....	34
Figure 4.6	SmartCap Fatigue Monitoring Solution	35
Figure 4.7	Vuzix 3000 Series Smart Glasses with Waveguide Technology	37
Table 2.1	Wearable Devices by Enterprise and Industrial Use Cases – Current versus Future Adoption	11
Table 4.1	Additional Industry Participants.....	37

SECTION 10

SCOPE OF STUDY

This Tractica report covers the market for enterprise and industrial wearables, providing comprehensive coverage of the various wearable device types, their specific roles, and adoption timelines in the workplace. The devices covered include smart watches, smart glasses, fitness trackers, smart clothing, body sensors, wearable cameras, and other wearables. The report also includes market sizing and forecasts from 2015 to 2021, providing shipments and revenue, while segmenting the market by device type, region, enterprise, and industrial use cases.

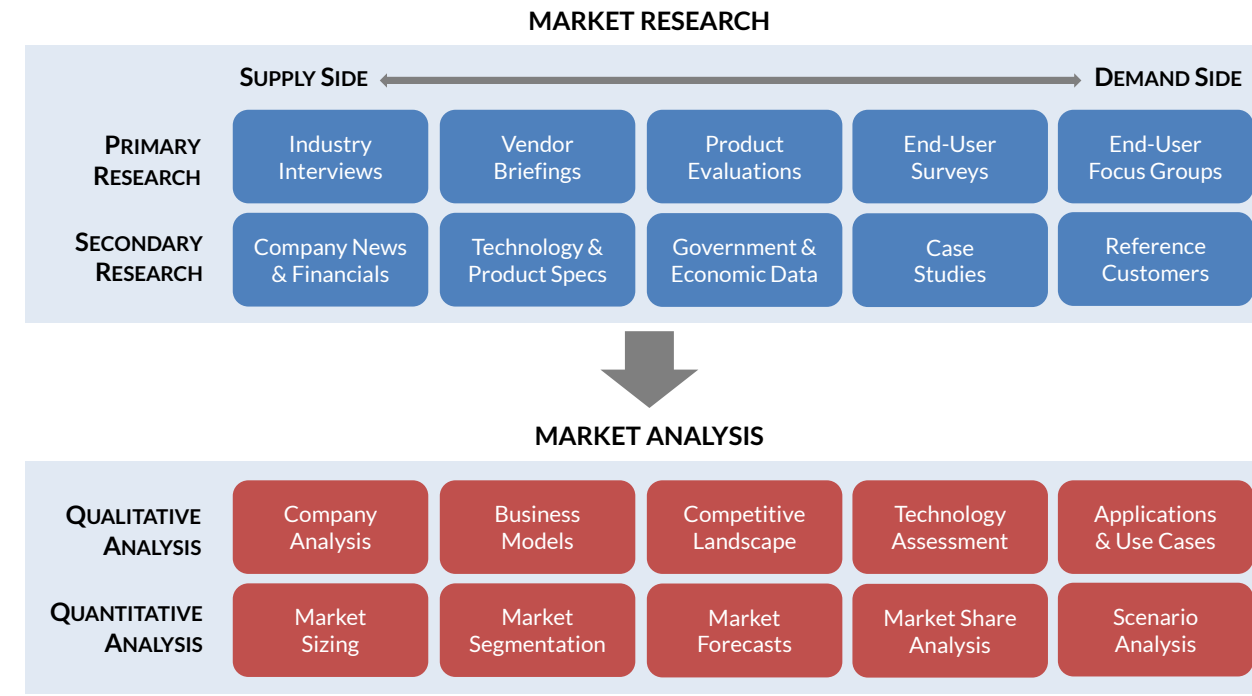
SOURCES AND METHODOLOGY

Tractica is an independent market research firm that provides industry participants and stakeholders with an objective, unbiased view of market dynamics and business opportunities within its coverage areas. The firm's industry analysts are dedicated to presenting clear and actionable analysis to support business planning initiatives and go-to-market strategies, utilizing rigorous market research methodologies and without regard for technology hype or special interests including Tractica's own client relationships. Within its market analysis, Tractica strives to offer conclusions and recommendations that reflect the most likely path of industry development, even when those views may be contrarian.

The basis of Tractica's analysis is primary research collected from a variety of sources including industry interviews, vendor briefings, product demonstrations, and quantitative and qualitative market research focused on consumer and business end-users. Industry analysts conduct interviews with representative groups of executives, technology practitioners, sales and marketing professionals, industry association personnel, government representatives, investors, consultants, and other industry stakeholders. Analysts are diligent in pursuing interviews with representatives from every part of the value chain in an effort to gain a comprehensive view of current market activity and future plans. Within the firm's surveys and focus groups, respondent samples are carefully selected to ensure that they provide the most accurate possible view of demand dynamics within consumer and business markets, utilizing balanced and representative samples where appropriate and careful screening and qualification criteria in cases where the research topic requires a more targeted group of respondents.

Tractica's primary research is supplemented by the review and analysis of all secondary information available on the topic being studied, including company news and financial information, technology specifications, product attributes, government and economic data, industry reports and databases from third-party sources, case studies, and reference customers. As applicable, all secondary research sources are appropriately cited within the firm's publications.

All of Tractica's research reports and other publications are carefully reviewed and scrutinized by the firm's senior management team in an effort to ensure that research methodology is sound, all information provided is accurate, analyst assumptions are carefully documented, and conclusions are well-supported by facts. Tractica is highly responsive to feedback from industry participants and, in the event errors in the firm's research are identified and verified, such errors are corrected promptly.

Chart 10.1 Tractica Research Methodology


(Source: Tractica)

NOTES

CAGR refers to compound annual growth rate, using the formula:

$$\text{CAGR} = (\text{End Year Value} \div \text{Start Year Value})^{(1/\text{steps})} - 1.$$

CAGRs presented in the tables are for the entire timeframe in the title. Where data for fewer years are given, the CAGR is for the range presented. Where relevant, CAGRs for shorter timeframes may be given as well.

Figures are based on the best estimates available at the time of calculation. Annual revenues, shipments, and sales are based on end-of-year figures unless otherwise noted. All values are expressed in year 2016 U.S. dollars unless otherwise noted. Percentages may not add up to 100 due to rounding.

Published 2Q 2016

© 2016 Tractica LLC
1111 Pearl Street, Suite 201
Boulder, CO 80302 USA
Tel: +1.303.248.3000
Email: info@tractica.com
www.tractica.com

This publication is provided by Tractica LLC (“Tractica”). This publication may be used only as expressly permitted by license from Tractica and may not otherwise be reproduced, recorded, photocopied, distributed, displayed, modified, extracted, accessed or used without the express written permission of Tractica. Notwithstanding the foregoing, Tractica makes no claim to any Government data and other data obtained from public sources found in this publication (whether or not the owners of such data are noted in this publication). If you do not have a license from Tractica covering this publication, please refrain from accessing or using this publication. Please contact Tractica to obtain a license to this publication.