SMARTECHMARKETS P U B L I S H I N G

CUTTING EDGE 3D PRINTING AND ADDITIVE MANUFACTURING INDUSTRY ANALYSIS AND MARKET FORECASTING

ABOUT SMARTECH PUBLISHING

- LEADING PROVIDER OF INDUSTRY ANALYSIS REPORTS AND CONSULTING SERVICES FOR THE 3D PRINTING AND ADDITIVE MANUFACTURING INDUSTRY
- BROADEST AND DEEPEST MARKET RESEARCH CATALOGUE ON 3D PRINTING AND ADDITIVE MANUFACTURING IN THE WORLD
- COVERAGE OF OPPORTUNITY AREAS ACROSS THE INDUSTRY WITH IN-DEPTH STUDIES AND MARKET DATA
- PURPOSE-BUILT PROPRIETARY ADDITIVE MANUFACTURING MARKET OPPORTUNITY MODELS FOR RELIABLE FORECASTING OF 3D PRINTING BUSINESS OPPORTUNITIES
- CLIENT ROSTER INCLUDES THE LARGEST 3D PRINTER FIRMS, MATERIALS FIRMS AND INVESTORS IN THE WORLD

SMARTECH PUBLISHING: AREAS OF COVERAGE

APPLICATIONS	MATERIALS	EQUIPMENT
AEROSPACE	BIOMATERIALS	PERSONAL 3D PRINTERS
AUTOMOTIVE	CERAMICS	PROFESSIONAL 3D PRINTERS
BIOPRINTING	COMPOSITES	PRODUCTION 3D PRINTERS
DENTAL	METALS	SOFTWARE
EDUCATION	NICKEL ALLOYS	3D SCANNERS
ELECTRONICS	POLYMERS	Materials
MAKERS	PRECIOUS METALS	Services Software
JEWELRY	STAINLESS STEEL	\$1,125 M
MEDICAL	TITANIUM	
OIL & GAS		2018 2019 2020 2021 2022
SERVICE BUREAUS		PROJECTED AUTOMOTIVE 3DP OPPORTUNITIES BY CATEGORY

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Historic Change: Unlocking Demand for Real AM Solutions

The AM market is entering a period unlike any in its history.

Growth is fragmented across segments, uneven, and has been repressed in hardware for two years.

Yet, reports market wide present a picture of unprecedented demand for additive manufacturing solutions.

How will competitors unlock this pent up demand, and where does the disconnect exist?



Market Awareness – Print Technology Platform Evolution

Many manufacturers in automotive, consumer products, industrial equipment, defense, and aerospace do not believe current 3D printers/AM systems meet their ultimate goals.

Despite this, an increasing number of influential manufacturers are developing AM strategies.

Whether a reflection of reality, or of simply misconception, many manufacturers have significant demands for AM technologies which are currently unmet.

SmarTech Publishing believes this is a primary driver of print technology platform evolution and development.



AREAS OF COVERAGE: AEROSPACE

SMARTECH PUBLISHING HAS UNDERTAKEN CONSULTING ASSIGNMENTS THAT EXPLORE THE ROLE OF 3DP IN CIVIL AND MILITARY AVIATION AND IN SPACE VEHICLES

With more penetration of 3DP in aerospace than any other segment, 3D printing/additive manufacturing is well established in the aerospace industry.

3DP AEROSPACE HIGHLIGHTS

- Surging demand from emerging economies in the commercial aerospace industry sets the stage for AM expenditures by aerospace firms to be \$2.7 Billion in 2020, SmarTech Markets forecasts.
- Airbus, has announced that its A350XWB aircraft will include more than 1,000 3D-printed parts.



SMARTECH PUBLISHING HAS DONE EXTENSIVE BUSINESS ANALYSIS FOR THE 3DP AEROSPACE COMPOSITES MARKET AND FOR 3DP AEROSPACE COMPONENTS COMFORMANCE TESTING



AREAS OF COVERAGE: AEROSPACE

SMARTECH PUBLISHING OFFERS REPORTS SPANNING AM/3DP OPPORTUNITIES IN COMMERCIAL AND GENERAL AVIATION, AND SPACE/DEFENSE AEROSPACE



OPPORTUNITIES FOR ADDITIVE MANUFACTURING IN COMMERCIAL AND GENERAL AVIATION: Identifies opportunities for 3D printing in commercial and general aviation industries, including jetliners, helicopters, and civilian aircraft. Covers 3DP opportunities in civilian aerospace manufacturing.



ADDITIVE MANUFACTURING IN SPACE AND DEFENSE AEROSPACE MARKETS: Presents high-value market opportunities and product and market strategies in space and defense aerospace markets. Explores the unique challenges, requirements, and potential benefits of 3DP in emerging space and defense applications. Coverage includes space vehicles, satellites, military aircraft, missile systems and UAVs.

AREAS OF COVERAGE: AUTOMOTIVE

AS THE FIRST FIRM TO PUBLISH REPORTS ON ADDITIVE MANUFACTURING IN THE AUTOMOTIVE INDUSTRY, SMARTECH HAS EXTENSIVE EXPERTISE IN THIS SECTOR

As a prime target for vertically-integrating print solutions developers, and with an enormous global manufacturing footprint, the automotive industry is both established in its use of classic 3D printing rapid prototyping technology, and a prime target for AM innovation over the next decade.

3DP AUTOMOTIVE HIGHLIGHTS

- Groupe PSA is partnering with Divergent 3D, a 3DP startup for whole vehicle structures.
- Audi says its goal is to use metal powder bed fusion for regular car part production. Ford says printed more than 500,000 parts during its product development for a new Mustang.
- SmarTech Publishing believes that the automotive 3D Printing market is growing at a CAGR of 28%.

SMARTECH PUBLISHING PERFORMS EXTENSIVE FORECASTING IN THIS AREA, ANALYZING MARKET POTENTIAL FOR 3DP BY INDIVIDUAL CAR FACTORIES AND GEOGRAPHICAL REGIONS



AREAS OF COVERAGE: AUTOMOTIVE

SMARTECH PUBLISHING'S AUTOMOTIVE REPORTS ANALYZE AND FORECAST AM IN THE AUTO INDUSTRY; ONE OF THE FASTEST GROWING 3DP SECTORS IN THE NEXT DECADE



ADDITIVE MANUFACTURING OPPORTUNITIES IN AUTOMOTIVE – 2016: AN OPPORTUNITY ANALYSIS AND TEN-YEAR FORECAST:

Lays out a roadmap for a divergent adoption path for 3D printing, with an eye on automobile production. Identifies opportunities and resulting commercial implications as the stage is set for the auto industry to become one of the largest AM technology markets over the next decade.

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3D-PRINTED COMPOSITES MATERIALS MARKETS - 2017: AN OPPORTUNITY ANALYSIS AND TEN-YEAR FORECAST:

Composites are being used in light-weight cars and trucks. This report projects revenues from 3D-printed composites, examining actual fabrication and current R&D in a number of industries including automotive, aerospace, medical, and consumer goods. Also considers how 3DP is being targeted towards new kinds of composites including nanocomposites.

SMARTECH PUBLISHING OFFERS COMPREHENSIVE COVERAGE OF 3DP IN MEDICAL DEVICES AND TISSUE ENGINEERING, THROUGH DICUSSIONS WITH PIONEERS

3DP enables a new level of medical device customization. SmarTech coverage includes:

- Orthopedic implants
- Printed surgical tools
- Medical models and prototypes
- Prosthetics and related parts
- Medical manufacturing
- Orthotic and ophthalmic devices
- Bioprinting

3DP MEDICAL HIGHLIGHTS

- SmarTech Publishing believes that medical 3DP will be largest segment of the 3DP industry by 2022
- Dubai Health Authority says that all Dubai hospitals will have adopted some form of 3D printing technology by 2017 for a variety of applications.

SMARTECH PUBLISHING HAS AN INSIDER'S UNDERSTANDING OF CURRENT AND FUTURE DEVELOPMENTS FOR MEDICAL DEVICE MANUFACTURERS AND MAJOR RESEARCH HOSPITALS

SMARTECH PUBLISHING USES PROPRIETARY 3DP MARKET OPPORTUNITY MODELS FOR **RELIABLE FORECASTING OF BUSINESS OPPORTUNITIES IN MEDICINE**



3D PRINTING IN MEDICAL MARKETS 2015: AN OPPORTUNITY ANALYSIS AND TEN-YEAR FORECAST:

Identifies the main opportunities for 3DP in medical environments, and current and future sources of revenue. Covers current technical weaknesses in 3DP, and how 3D printers, software and services must adapt to become a commercial success. Provides coverage of all current medical applications for 3DP and granular ten-year forecasts of 3DP in the medical sector in both volume and revenue terms. **SMARTECH**MARKETS



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3D-PRINTED MEDICAL PROSTHETICS MARKETS:

Forecasts the future of 3D-printed medical prosthetics and orthotics in both volume and value, including how the supply chain is emerging in this space. Discusses how capabilities of 3DP in prosthetics are extending beyond often-highlighted applications such as 3D-printed hands. Explores capabilities of 3DP into lower extremity prosthetics, medical braces for skeletal system treatments, printed insoles, and other applications.

SMARTECH PUBLISHING PROVIDES INSIGHT INTO THE PROSPECTS FOR MEDICAL 3D PRINTING START-UPS



3D-PRINTED MEDICAL IMPLANT MARKETS: ORTHOPEDIC AND OTHER APPLICATIONS: Explores trends, commercial implications, and revenue potential for 3DP medical implant markets. As implants reach minimum real-world trial length, new orthopedic procedures are set to achieve future commercial success, with applications expanding to serve more specialty cases where traditional treatments fail.



OPPORTUNITIES FOR ADDITIVE MANUFACTURING IN SURGICAL PLANNING AND MODELING:

Covers primary market opportunities including printed anatomical models, multimaterial professional systems, and printed surgical guides and tools markets. Explores how these components come together to provide 3D print enabled surgical planning services – the future of surgical practice.

SMARTECH TO RELEASE NEW REPORT ON BIOPRINTING, MARCH 2017

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SMARTECH PUBLISHING HAS EXTENSIVE UNDERSTANDING OF THE WAYS IN WHICH 3D PRINTING IS INCREASINGLY USED IN THE DENTAL SPACE



3D PRINTING IN DENTISTRY 2016: A TEN-YEAR FORECAST AND OPPORTUNITY ANALYSIS:

Digital dentistry is the way of the future and the dental industry continues to be a strong driver of 3DP development, with 12% annual revenue growth in the AM dental sector since 2015. SmarTech Publishing's second annual study of 3DP in the dental sector analyzes the commercial implications of the major trends of the last twelve months.

3DP DENTAL HIGHLIGHTS

- Dental 3D printing hardware revenue has increased significantly in the past few years, thanks to attractive applications in permanent dental restorations and acceptance from the world's leading dental suppliers
- Revenues of \$4.3 Billion will be generated for 3D printing by the dental industry in 2022



SMARTECH PUBLISHING WORKS CLOSELY WITH METAL ADDITIVE MANUFACTURING COMPANIES AND HAS UNMATCHED KNOWLEDGE IN THIS AREA

Metals are by far the fastest growing materials segment in 3DP, with new metals and metal alloys being added continuously.

3DP METALS HIGHLIGHTS

- SmarTech Publishing projects that expenditures by aerospace firms on additive manufacturing in 2022 will be \$2.7 Billion.
- Airbus has announced that its A350XWB aircraft will include more than 1,000 3D-printed parts.



SMARTECH CONSULTS FOR NUMEROUS METAL MANUFACTURING FIRMS, ASSESSING MARKET ENTRY OPPORTUNITIES OF 3DP IN VARIOUS METALS



SMARTECH PUBLISHING WAS THE FIRST TO PUBLISH EXTENSIVE STUDIES OF THE ADDITIVE MANUFACTURING METAL MARKET BY METAL TYPE



OPPORTUNITIES FOR NICKEL ALLOYS IN ADDITIVE MANUFACTURING -2017: AN OPPORTUNITY ANALYSIS AND TEN-YEAR FORECAST:

The first ever multi-market deep dive research study into AM with nickel alloys utilizing powder based 3DP. Covers current and future potential for short run and serial production utilizing AM. Over the next decade, nickel alloys will become the second most demanded material for AM processes.



TITANIUM OPPORTUNITIES IN ADDITIVE MANUFACTURING -2017: AN OPPORTUNITY ANALYSIS AND TEN-YEAR FORECAST:

Up to the minute report on AM titanium market opportunities. With revenues exceeding all other alloy groups in the next decade, titanium is becoming the largest opportunity for metal AM, with its high strength to weight ratio, biological inertness, and other desirable properties when combined with AM.

SMARTECH PUBLISHING WAS THE FIRST TO PUBLISH EXTENSIVE STUDIES OF THE ADDITIVE MANUFACTURING METAL MARKET BY METAL TYPE



ADDITIVE MANUFACTURING WITH METAL POWDERS 2016: AN OPPORTUNITY ANALYSIS AND TEN-YEAR FORECAST: The metal additive manufacturing segment has continued on a path of explosive growth. This report explores the imminent shift from tactical manufacturing of lowvolume components and prototypes to serial production and integration into established manufacturing environments.



THE PRODUCTION MANAGER'S COMPLETE GUIDE TO: **3D PRINTING WITH METALS:** This guide is an accessible entry point for production managers into the world of metal additive manufacturing. It is focused on the requirements and practical aspects of implementing metals printing including providing direction on equipment choice, process integration and materials selection.

SMARTECH PUBLISHING WAS THE FIRST TO PUBLISH EXTENSIVE STUDIES OF THE ADDITIVE MANUFACTURING METAL MARKET BY METAL TYPE

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3D-PRINTED METALS: A PATENT LANDSCAPE ANALYSIS - 2016: A report on the patent landscape of 3D printed metals. Presents the quantitative patent landscape, essential for identifying the players, technologies, patent filing velocity, geographic distribution, and technology classifications in the 3DP metals area. Based on an extensive search of relevant patents and patent applications.



OPPORTUNITIES FOR 3D PRINTING PRECIOUS METALS: JEWELRY AND OTHER APPLICATIONS:

SmarTech Publishing expects 3DP of gold, silver, platinum, and precious metal alloys to present important opportunities shortly, as 3DP will be used to directly fabricate jewelry, timepiece components and accessories. We expect precious metals to be used in medical, dental, and electronic sectors. 3Dprinted electronics is expected to use silver and gold inks for customized and short run fabrication of antennas and PCBs.

AREAS OF COVERAGE: POLYMERS

SMARTECH PUBLISHING HAS COVERED POLYMERS SINCE THE EARLIEST DAYS OF THE 3DP REVOLUTION, RECENTLY EXTENDING ITS ANALYSIS TO COMPOSITES

3D printing began with polymer rapid prototyping 30 years ago. Now, 3DP polymers are evolving to rapid tooling and manufacturing applications in ways that will enable the market for 3D-printed polymers to achieve massive growth

3DP POLYMERS HIGHLIGHTS

- The 3D printing business is expected to consume \$3.6 Billion in polymer materials by 2022
- Large specialty chemical companies are increasingly developing polymer print solutions. Meanwhile OEMs hope to continue to lock customers into their own branded materials. We believe an increasing degree of cooperation is necessary between the major polymer material suppliers and 3D print technology vendors

SMARTECH PUBLISHING'S ANALYSIS SHOWS WHERE THE MONEY WILL BE MADE IN THE NEXT GENERATION OF 3D-PRINTED POLYMERS SMARTECHMARKETS

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AREAS OF COVERAGE: POLYMERS

SMARTECH PUBLISHING PRESENTS DETAILED MARKET FORECASTS AND ANALYSES ON THERMOPLASTIC FILAMENTS, POWDERS, PHOTOPOLYMERS, COMPOSITES, AND MORE



3D PRINTED POLYMERS: A PATENT LANDSCAPE ANALYSIS – 2016: Provides guidance on current sources of IP in the 3D printed polymers space, where patents are barriers to entry and where there are patent gaps. Includes an extensive patent database and a 50-page granular analysis, commentary and guidance on the 3DP patent environment by SmarTech Publishing's in-house IP expert. Essential reading by firms in the 3DP sector, venture capitalists and other active investors.



POLYMER MATERIALS: 3D PRINTING OPPORTUNITIES - 2015: The most comprehensive analysis of polymer 3D printing technology available, with a focus on evolution in polymer print materials and subsequent market opportunities. Polymer use in 3DP is evolving into rapid tooling and manufacturing applications, which will enable the thermoplastics, composites, and photopolymers markets to achieve massive growth over the next decade.

AREAS OF COVERAGE: OTHER 3DP APPLICATIONS

EACH YEAR SMARTECH PUBLISHING BEGINS COVERAGE OF NEW TOPICS IN THE 3D PRINTING / ADDITIVE MANUFACTURING SPACE



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ADDITIVE MANUFACTURING OPPORTUNITIES IN OIL & GAS MARKETS 2016: A TEN-YEAR FORECAST: Increasing use of AM in the Oil and Gas Industry for the past twelve months leads SmarTech Publishing to believe that this industry will be the next big adopter of AM technologies. This report explores and identifies major opportunities for AM over the next decade, based on the specific dynamics of the global oil and gas market.





OPPORTUNITIES FOR 3D PRINTING IN THE ELECTRONICS INDUSTRY - 2016: 3DP has branched out from R&D facilities in the electronics industry, becoming mainstreamed for electronics applications. SmarTech Publishing sees a growing interest in 3DP for customized circuitry and sensors, and for wide-area electronics in the long term. 3DP will become a major way of manufacturing low volume electronics -high speed optoelectronics, for example.

SMARTECH TO RELEASE NEW REPORT ON CERAMICS, AUGUST 2017

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CONSULTING SERVICES

LEVERAGING CUSTOMER INTERVIEWS, THE MOST UP TO DATE PUBLISHED SOURCES, ACADEMIC RESEARCH, FINANCIALS AND IP DATABASE ANALYSIS

3DP BUSINESS STRATEGY CONSULTING PROVIDES ASSISTANCE WITH:

- Identifying key target markets and market gaps
- Creating new customer bases and supply chains
- Establishing pricing strategies through studies of current materials and equipment pricing and forecasting
- Formulating 3DP strategies and selling propositions for maximum competitive advantage

3DP MERGERS & ACQUISITIONS AND FINANCIAL ANALYSIS

Due diligence and support for investor presentations



CONSULTING SERVICES

CUSTOMIZED ANALYSIS AND FORECASTS THAT GO BEYOND WHAT'S AVAILABLE IN OUR PUBLISHED REPORTS

TECHNOLOGY APPRAISAL AND SCOUTING

- Assistance in identifying the latest 3DP technologies and materials
- > Detailed timeframes for the evolution of the latest 3DP technology advancements
- Revenue scenarios and insights into likely commercially successful startups in new areas

PRODUCT DIFFERENTIATION AND NEW PRODUCT INTRODUCTION

Consulting for vendors of printers, software, materials and services on product design and differentiation

COMPETITIVE ANALYSIS

- Customized competitor analysis to allow better assessment of the state of competition worldwide
- In-house appraisal of competitive advantage gained through acquisition of superior patents and other IP

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LAWRENCE GASMAN, PRESIDENT



Lawrence Gasman founded SmarTech Publishing and is acknowledged worldwide as an expert on technology forecasting and assessment. He has carried out consulting on topics ranging from optical networking, to advanced materials, to augmented reality. His clients include multinationals, startups and investors. He has spoken at **Additive Aerospace** and **Additive Disruption**, advised on product introduction, market positioning and strategy, and has provided due diligence for M&A activity and served on the technology advisory board of a major specialty chemical firm.

Lawrence founded two other industry analyst firms, and has authored four books and numerous articles on nanotechnology and telecom. He was educated at Manchester University, with advanced degrees from London School of Economics and London Business School.

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SCOTT DUNHAM, VICE PRESIDENT OF RESEARCH



Scott Dunham is Vice President of Research at SmarTech Publishing. He has authored more than a dozen in-depth market research studies on various aspects of the 3D printing industry, giving him one of the widest perspectives on the technology in the world. He has spoken at **Additive Aerospace, Additive Disruption, Rapid**, and **Inside 3D Printing.**

With five years in technology based market research, four devoted to 3D printing, Scott has expertise in identifying opportunities in the 3D printing industry and years of research experience in the areas of advanced manufacturing and 3D printing. Scott holds a BA in Marketing & Research from the University of Kentucky's Gatton School of Business and Economics.

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DAVIDE SHER, SENIOR ANALYST



Davide Sher is a Senior Analyst at SmarTech Publishing. He brings with him extensive experience as a technology journalist and communication consultant, and has close ties with 3D printing and materials companies throughout Europe, Asia, and Israel. Davide has authored SmarTech's composites and jewelry reports among others. Prior to joining SmarTech Publishing, Davide founded 3Dprintingbusiness.directory, currently the largest global directory of 3D printing related companies, as well as Replicatore.it, the leading Italian 3DP news portal.

An Italian native, Davide spent 12 years in the United States, where he received his BA from SUNY Stony Brook. He now lives in Milan and collaborates with several 3D printing news portals.

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MISSY WADE, VICE PRESIDENT OF SALES AND CONTENT



Missy Wade is the Vice President of Sales and Content for SmarTech Publishing. She has had over 20 years of experience in administrative, sales and medical fields. Missy coordinates all sales activity at SmarTech Publishing and works closely with clients to ensure that they get the products and services that they need. Missy also manages all social media marketing at SmarTech Publishing, collaborating with our Web management team so that our customers can have a user-friendly experience on our Website.

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