

The Global Market for Wearable Technologies 2021-2031

<https://marketpublishers.com/r/G848C2AAEDB6EN.html>

Date: November 2021

Pages: 510

Price: US\$ 1,400.00 (Single User License)

ID: G848C2AAEDB6EN

Abstracts

Wearables are body-borne computational and sensory devices which can sense the person who wears them and/or their environment. Wearables can communicate either directly through embedded wireless connectivity or through another device (e.g. a smartphone). The data collected by the wearable device about the user or its environment is processed in a processing unit located locally or in an external server, and the results are ultimately provided to the wearer. Smart wearables may have control, communication, storage and actuation capabilities. The number and variety of wearable electronic devices has increased significantly in the past few years, as they offer significant enhancements to human comfort, health and well-being.

There is increasing demand for wearable electronics from industries such as:

Medical and healthcare monitoring and diagnostics.

Sportswear and fitness monitoring (bands).

Consumer electronics such as smart watches, smart glasses and headsets.

Military GPS trackers, equipment (helmets) and wearable robots.

Smart apparel and footwear in fashion and sport.

Workplace safety and manufacturing.

Wearable and mobile health monitoring technologies are important due to the rapidly

aging global populations and the drastically increasing demand for in-home healthcare. Commercially available and near commercial wearable devices facilitate the transmission of biomedical informatics and personal health recording. Body worn sensors, which can provide real-time continuous measurement of pertinent physiological parameters noninvasively and comfortably for extended periods of time, are of crucial importance for emerging applications of mobile medicine.

Advancements over the last few years in electronics have also led to the development of electronic (E-textiles) or smart textiles. Smart textiles and garments can sense environmental stimuli and react or adapt in a predetermined way. This involves either embedding or integrating sensors/actuators and electronic components into textiles for use in applications such as medical diagnostics and health monitoring, consumer electronics, safety instruments and automotive textiles.

Report contents include:

In-depth market review of current products and technology development in Smartwatches, sports and fitness trackers, sleep trackers and wearable monitors, hearables, Smart glasses and head-mounted displays (VR, AR, MR, vision loss and eye trackers), military, Industrial and workplace monitoring, flexible and stretchable electronics, e-textiles and smart clothing, artificial skin, skin patches, wearable health alert and monitoring devices, Continuous glucose monitoring (CGM), hydration and sweat sensors, wearable drug delivery, cosmetics patches, smart footwear, smart contact lenses, smart wound care, exoskeletons and hearables.

In depth product assessment including products, producers, functionalities and prices.

Global market revenues, historical and forecast to 2031 for wearable electronics, medical wearables, electronic textiles and smart clothing and sub markets thereof.

Over 300 company profiles. Companies profiled include BeBop Sensors, dorsaVi Ltd, Enhancelabo Co., Ltd., Equivital Inc., FeelIT, HP1 Technologies Ltd., miomove s.r.o, Neosensory, Abbott Laboratories, Add Care Ltd., AerBetic, Inc., Avanix srl, Biobeat Technologies Ltd., biolinq Inc, CareWear, Cosinuss GmbH, Seventh Sense Biosystems, Cogwear, WearOptimo, Rhaeos, Neurava and many more.

Contents

1 EXECUTIVE SUMMARY

- 1.1 The evolution of electronics
 - 1.1.1 The wearables revolution
 - 1.1.2 Wearable market leaders
 - 1.1.3 Flexible, stretchable, thin, and large-area form factors
 - 1.1.4 From rigid to flexible and stretchable
 - 1.1.5 Flexible and stretchable electronics in wearables
 - 1.1.6 Stretchable artificial skin
 - 1.1.7 Organic and printed electronics
 - 1.1.8 New conductive materials
 - 1.1.9 Foldable smartphones and tablets
 - 1.1.10 Entertainment
- 1.2 Growth in flexible and stretchable electronics market
- 1.3 Innovations at CES 2021
- 1.4 Investment funding 2019-2021
- 1.5 Market revenues 2015-2031
 - 1.5.1 Smartwatches and activity trackers
 - 1.5.2 E-textiles and smart clothing
 - 1.5.3 Wearable cameras
 - 1.5.4 Virtual reality, augmented reality and mixed reality
 - 1.5.5 Electronic skin patches
 - 1.5.6 Hearables

2 THE WEARABLE CONSUMER ELECTRONICS MARKET

- 2.1 Market drivers and trends
- 2.2 Recent developments
- 2.3 Smartwatches
 - 2.3.1 Recent innovations
 - 2.3.2 Health monitoring
 - 2.3.3 Energy harvesting for powering smartwatches
 - 2.3.4 Main smart watch producers and products
- 2.4 Sports and fitness trackers
 - 2.4.1 Wearable devices
 - 2.4.2 Skin patches
 - 2.4.3 Products

- 2.5 Sleep trackers and wearable monitors
 - 2.5.1 Built in function in smart watches and fitness trackers
 - 2.5.2 Smart rings
 - 2.5.3 Headbands
 - 2.5.4 Patches
 - 2.5.5 Masks
- 2.6 Smart glasses and head-mounted displays (VR, AR, MR, vision loss and eye trackers)
 - 2.6.1 Products
 - 2.6.2 Virtual Reality (VR) devices
 - 2.6.3 Augmented (AR) headsets and smart glasses
 - 2.6.4 Mixed Reality (MR) smart glasses
- 2.7 Hearables
 - 2.7.1 Key players
 - 2.7.2 Markets for hearables
 - 2.7.2.1 Industrial hearables
 - 2.7.2.2 Wireless headphones
 - 2.7.2.3 Hearing aids
 - 2.7.2.4 Biometric monitoring
- 2.8 Military wearables
- 2.9 Industrial and workplace monitoring
 - 2.9.1 Products
- 2.10 Global market size
 - 2.10.1 By product type, 2015-2031, billions USD
 - 2.10.2 Market share by product type
- 2.11 Market challenges
- 2.12 Company profiles 102 (65 company profiles)

3 MEDICAL AND HEALTHCARE WEARABLES

- 3.1 Market drivers
- 3.2 Current state of the art
 - 3.2.1 Wearable medical device products
 - 3.2.2 Temperature and respiratory rate monitoring
- 3.3 Wearable health monitoring and rehabilitation
 - 3.3.1 Companies and products
- 3.4 Electronic skin patches
 - 3.4.1 Applications
 - 3.4.2 Materials

- 3.4.2.1 Nanomaterials-based devices
- 3.4.3 Continuous glucose monitoring (CGM)
 - 3.4.3.1 Minimally-invasive CGM sensors
 - 3.4.3.2 Non-invasive CGM sensors
 - 3.4.3.3 Minimally-invasive and non-invasive glucose monitoring companies and products
- 3.4.4 Cardiovascular
 - 3.4.4.1 ECG sensors
 - 3.4.4.1.1 Companies and products
 - 3.4.4.2 PPG sensors
 - 3.4.4.2.1 Companies and products
- 3.4.5 Pregnancy and newborn monitoring
 - 3.4.5.1 Companies and products
- 3.4.6 Wearable temperature monitoring
 - 3.4.6.1 Companies and products
- 3.4.7 Hydration sensors
 - 3.4.7.1 Companies and products
- 3.4.8 Wearable sweat sensors (medical and sports)
 - 3.4.8.1 Companies and products
- 3.5 Wearable drug delivery
 - 3.5.1 Companies and products
- 3.6 Cosmetics patches
 - 3.6.1 Companies and products
- 3.7 Smart footwear for health monitoring
 - 3.7.1 Companies and products
- 3.8 Smart contact lenses
 - 3.8.1 Companies and products
- 3.9 Smart woundcare
 - 3.9.1 Companies and products
- 3.10 Wearable exoskeletons
 - 3.10.1 Companies and products
- 3.11 Medical hearables
 - 3.11.1 Companies and products
- 3.12 Global market size
 - 3.12.1 By product type, 2015-2031, billions USD
 - 3.12.2 Market share, by product type
- 3.13 Market challenges
- 3.14 Company profiles 208 (160 company profiles)

4 ELECTRONIC TEXTILES (E-TEXTILES) AND SMART APPAREL

4.1 Market drivers

4.2 Materials and components

4.2.1 Conductive and stretchable yarns

4.2.2 Conductive coatings

4.2.3 Conductive inks

4.2.3.1 Metal-based conductive inks

4.2.3.1.1 Nanoparticle ink

4.2.3.1.2 Silver inks

4.2.3.1.2.1 Silver flake

4.2.3.1.2.2 Silver nanoparticle ink

4.2.3.1.2.3 Performance

4.2.3.1.2.4 Conductivity

4.2.3.1.2.5 Particle-Free silver conductive ink

4.2.3.1.2.6 Producers

4.2.3.1.3 Copper inks

4.2.3.1.3.1 Properties

4.2.3.1.3.2 Copper oxide nanoparticles

4.2.3.1.3.3 Silver-coated copper

4.2.3.1.3.4 Producers

4.2.3.1.4 Gold (Au) ink

4.2.3.1.4.1 Properties

4.2.3.1.4.2 Producers

4.2.3.2 Carbon-based conductive inks

4.2.3.2.1 Carbon nanotubes

4.2.3.2.1.1 Properties

4.2.3.2.1.2 Single-walled carbon nanotubes

4.2.3.2.1.3 Companies

4.2.3.2.2 Graphene

4.2.3.2.2.1 Properties

4.2.3.2.2.2 Companies

4.2.3.3 Polymers

4.2.3.3.1 PDMS

4.2.3.3.2 PEDOT: PSS

4.2.3.3.3 Polyaniline (PANI)

4.2.3.3.4 Polypyrrole (PPy)

4.2.4 Nanomaterials

4.2.4.1 Nanocoatings in smart textiles

- 4.2.4.2 Graphene
- 4.2.4.3 Nanofibers
- 4.2.4.4 Carbon nanotubes
- 4.2.5 Phase change materials
 - 4.2.5.1 Temperature controlled fabrics
- 4.3 Smart clothing products
- 4.4 Electronic textile products
- 4.5 Temperature monitoring and regulation
 - 4.5.1 Heated clothing
 - 4.5.2 Heated gloves
 - 4.5.3 Heated insoles
 - 4.5.4 Heated jacket and clothing products
 - 4.5.5 Materials used in flexible heaters and applications
 - 4.5.6 Stretchable E-fabrics
- 4.6 Wearable therapeutic products
- 4.7 Sports and fitness
- 4.8 Smart footwear
 - 4.8.1 Medical and therapeutic footwear
 - 4.8.2 Fitness tracking
 - 4.8.3 Key players
 - 4.8.4 Companies and products
- 4.9 Military
- 4.10 Flexible and wearable display advertising
- 4.11 Textile-based lighting
 - 4.11.1 OLEDs
- 4.12 Smart diapers
 - 4.12.1 Companies and products
- 4.13 Automotive
- 4.14 Powering E-textiles
 - 4.14.1 Batteries
 - 4.14.2 Supercapacitors
 - 4.14.3 Energy harvesting
 - 4.14.3.1 Photovoltaic solar textiles
 - 4.14.3.2 Energy harvesting nanogenerators
 - 4.14.3.3 TENGs
 - 4.14.3.4 PENGs
 - 4.14.3.5 Radio frequency (RF) energy harvesting
- 4.15 Global market size
 - 4.15.1 By product type, 2015-2031, billions USD

- 4.15.2 Market share, by product type
- 4.16 Market challenges
- 4.17 Company profiles 403 (117 company profiles)

5 RESEARCH METHODOLOGY

6 REFERENCES

Tables

TABLES

- Table 1. Types of wearable devices and applications.
- Table 2. Types of wearable devices and the data collected.
- Table 3. Wearable market leaders by market segment.
- Table 4. Applications in printed, flexible and stretchable electronics, by advanced materials type and benefits thereof.
- Table 5. Advanced materials for Printed, flexible and stretchable sensors and Electronics-Advantages and disadvantages.
- Table 6. Sheet resistance (RS) and transparency (T) values for transparent conductive oxides and alternative materials for transparent conductive electrodes (TCE).
- Table 7. Foldable smartphones and tablets, on or near market.
- Table 8. Wearable electronics at CES 2021.
- Table 9. Wearables Investment funding 2019-2021.
- Table 10. Global revenues for Smartwatches and activity trackers, 2015-2031, billions USD.
- Table 11. Global revenues for E-textiles and smart clothing, 2015-2031, billions USD.
- Table 12. Global revenues for wearable cameras, 2015-2031, billions USD.
- Table 13. Global revenues for VR, AR & MR, 2015-2031, billions USD.
- Table 14. Global revenues for electronic skin patches, 2015-2031, billions USD.
- Table 15. Global market for hearables, 2017-2031, by product type, billions US\$.
- Table 16. Market drivers and trends in wearable electronics.
- Table 17. Wearable health monitors.
- Table 18. Main smart watch producers and products.
- Table 19. Wearable sensors for sports performance.
- Table 20. Wearable sensor products for monitoring sport performance.
- Table 21. Example wearable sleep tracker products and prices.
- Table 22. Smart ring products.
- Table 23. Sleep headband products.
- Table 24. Smart sleep mask products.
- Table 25. Smart glasses companies and products.
- Table 26. VR headset products.
- Table 27. Augmented reality (AR) smart glass products.
- Table 28. Mixed Reality (MR) smart glass products.
- Table 29. Wearable electronics applications in the military.
- Table 30. Wearable workplace products.
- Table 31. Global market for wearable electronics, 2015-2031, by product type, billions \$.

Table 32. Market challenges in wearable electronics.

Table 33. Market drivers for printed, flexible and stretchable medical and healthcare sensors and wearables.

Table 34. Examples of wearable medical device products.

Table 35. Medical wearable companies applying products to COVID-19 monitoring and analysis.

Table 36. Applications in flexible and stretchable health monitors, by advanced materials type and benefits thereof.

Table 37. Wearable bio-signal monitoring devices.

Table 38. Technologies for minimally-invasive and non-invasive glucose detection-advantages and disadvantages.

Table 39. Commercial devices for non-invasive glucose monitoring not released or withdrawn from market.

Table 40. Minimally-invasive and non-invasive glucose monitoring products.

Table 41. Companies developing wearable sweat sensors.

Table 42. Wearable drug delivery companies and products.

Table 43. Companies and products, cosmetics and drug delivery patches.

Table 44. Companies and products in smart footwear.

Table 45. Companies and products in smart contact lenses.

Table 46. Companies and products in smart wound care.

Table 47. Companies developing wearable exoskeletons.

Table 48. Companies and products in hearables.

Table 49. Global medical and healthcare wearables market, 2017-2031, billions \$, by product.

Table 50. Market challenges in medical and healthcare sensors and wearables.

Table 51. Market drivers for printed, flexible, stretchable and organic electronic textiles.

Table 52. Examples of smart textile products.

Table 53. Typical conductive ink formulation.

Table 54. Comparative properties of conductive inks.

Table 55. Comparison of silver nanoparticle inks with traditional inks.

Table 56. Silver conductive ink producers.

Table 57. Comparison of silver and copper properties.

Table 58. Copper conductive ink producers.

Table 59. Gold conductive ink producers.

Table 60: Properties of CNTs and comparable materials.

Table 61. Applications of carbon nanotubes in conductive ink.

Table 62: Carbon nanotube conductive ink producers.

Table 63: Properties of graphene.

Table 64. Market overview for graphene in conductive inks.

- Table 65. Electrical conductivity of different types of graphene.
- Table 66. Market and applications for graphene in conductive inks.
- Table 67: Graphene conductive ink producers.
- Table 68. Types of flexible conductive polymers, properties and applications.
- Table 69. Applications in textiles, by advanced materials type and benefits thereof.
- Table 70. Nanocoatings applied in the textiles industry-type of coating, nanomaterials utilized, benefits and applications.
- Table 71. Applications and benefits of graphene in textiles and apparel.
- Table 72. Properties of CNTs and comparable materials.
- Table 73. Applications and markets for e-textiles.
- Table 74. Commercially available smart clothing products.
- Table 75. Electronic textile products.
- Table 76. Heated jacket and clothing products.
- Table 77. Examples of materials used in flexible heaters and applications.
- Table 78. Companies and products in smart footwear.
- Table 79. Wearable electronics applications in the military.
- Table 80. Companies developing smart diaper products.
- Table 81. Comparison of prototype batteries (flexible, textile, and other) in terms of area-specific performance.
- Table 82. Global electronic textiles and smart clothing market 2017-2030, revenues (billions USD).
- Table 83. Market challenges in E-textiles.

Figures

FIGURES

Figure 1. Evolution of electronics.

Figure 2. Wove Band.

Figure 3. Wearable graphene medical sensor.

Figure 4. Stretchable transistor.

Figure 5. Artificial skin prototype for gesture recognition.

Figure 6. Applications timeline for organic and printed electronics.

Figure 7. Intel Horseshoe Bend.

Figure 8. ThinkPad X1 Fold.

Figure 9. Motorola Razr.

Figure 10. Galaxy Fold 2.

Figure 11. Galaxy Z Flip.

Figure 12. Tri-fold phone-tablet hybrid.

Figure 13. TCL rollable phone.

Figure 14. Xiaomi MIX Flex.

Figure 15. Baby Monitor.

Figure 16. Wearable health monitor incorporating graphene photodetectors.

Figure 17. Global revenues for Smartwatches and activity trackers, 2015-2031, billions USD.

Figure 18. Global revenues for E-textiles and smart clothing, 2015-2031, billions USD.

Figure 19. Global revenues for wearable cameras, 2015-2031, billions USD.

Figure 20. Global revenues for VR, AR & MR, 2015-2031, billions USD.

Figure 21. Global revenues for electronic skin patches, 2015-2031, billions USD.

Figure 22. Global market for hearables, 2017-2031, by product type, billions US\$.

Figure 23. Applications of wearable flexible sensors worn on various body parts.

Figure 24. The evolution of biometrics in Apple's Watch.

Figure 25. Wearable bio-fluid monitoring system for monitoring of hydration.

Figure 26. Beddr SleepTuner.

Figure 27. Vuzix Blade.

Figure 28. NReal Light MR smart glasses.

Figure 29. Market segmentation for hearables.

Figure 30. iOS versus Android earbud sales.

Figure 31. Global market for wearables, 2015-2031, by product type, billions US\$.

Figure 32. Global market for wearables, 2020-2031, by market share of product type

Figure 33. RealWear HMT-1.

Figure 34. Connected human body and product examples.

Figure 35. Companies and products in wearable health monitoring and rehabilitation devices and products.

Figure 36. Smart e-skin system comprising health-monitoring sensors, displays, and ultra flexible PLEDs.

Figure 37. Graphene medical patch.

Figure 38. Graphene-based E-skin patch.

Figure 39. Technologies for minimally-invasive and non-invasive glucose detection.

Figure 40. Schematic of non-invasive CGM sensor.

Figure 41. Adhesive wearable CGM sensor.

Figure 42. VitalPatch.

Figure 43. Wearable ECG-textile.

Figure 44. Wearable ECG recorder.

Figure 45. Nexkin™.

Figure 46. Bloomlife.

Figure 47. Enfucell wearable temperature tag.

Figure 48. TempTraQ wearable wireless thermometer.

Figure 49. Nanowire skin hydration patch.

Figure 50. NIX sensors.

Figure 51. Wearable sweat sensor.

Figure 52. Wearable sweat sensor.

Figure 53. Gatorade's GX Sweat Patch.

Figure 54. Sweat sensor incorporated into face mask.

Figure 55. Lab-on-Skin™.

Figure 56. D-mine Pump.

Figure 57. My UV Patch.

Figure 58. Overview layers of L'Oreal skin patch.

Figure 59. Digitsole Smartshoe.

Figure 60. Schematic of smart wound dressing.

Figure 61. REPAIR electronic patch concept. Image courtesy of the University of Pittsburgh School of Medicine.

Figure 62. Honda Walking Assist.

Figure 63. archelis wearable chair.

Figure 64. Nuheara IQbuds? Max.

Figure 65. Global medical and healthcare wearables market, 2017-2031, billions \$, by product.

Figure 66. Global market for medical and healthcare sensors and wearables, 2020-2031, by market share of product type.

Figure 67. Conductive yarns.

Figure 68. Conductive yarns.

- Figure 69. Demand for silver in the printed & flexible electronics market.
- Figure 70: Silver nanocomposite ink after sintering and resin bonding of discrete electronic components.
- Figure 71: Copper based inks on flexible substrate.
- Figure 72: Schematic of single-walled carbon nanotube.
- Figure 73: Stretchable SWNT memory and logic devices for wearable electronics.
- Figure 74: Nanotube inks
- Figure 75: Graphene layer structure schematic.
- Figure 76: BGT Materials graphene ink product.
- Figure 77. Applications of graphene in conductive inks.
- Figure 78: BGT Materials graphene ink product.
- Figure 79: Printed graphene conductive ink.
- Figure 80: Textiles covered in conductive graphene ink.
- Figure 81. SEM image of cotton fibers with PEDOT:PSS coating.
- Figure 82. Applications of graphene in smart textiles and apparel.
- Figure 83. PCM cooling vest.
- Figure 84. EXO2 Stormwalker 2 Heated Jacket.
- Figure 85. Flexible polymer-based heated glove, sock and slipper.
- Figure 86. ThermaCell Rechargeable Heated Insoles.
- Figure 87. Myant sleeve tracks biochemical indicators in sweat.
- Figure 88. Flexible polymer-based therapeutic products.
- Figure 89. iStimUweaR .
- Figure 90. Digitsole Smartshoe.
- Figure 91. MiJia smart shoes.
- Figure 92. Nike self-lacing HyperAdapt 1.0 shoes.
- Figure 93. Basketball referee Royole fully flexible display.
- Figure 94. ABENA Nova smart diaper.
- Figure 95. Textile-based car seat heaters.
- Figure 96. Micro-scale energy scavenging techniques.
- Figure 97. Schematic illustration of the fabrication concept for textile-based dye-sensitized solar cells (DSSCs) made by sewing textile electrodes onto cloth or paper.
- Figure 98. 3D print piezoelectric material.
- Figure 99. Global electronic textiles and smart clothing 2017-2030, revenues (billions USD).Source: Future Markets.
- Figure 100. Global market for electronics and smart textiles, 2020-2031, by market share of product type.
- Figure 101. LED hooded jacket.
- Figure 102. Heated element module.
- Figure 103. Athos Training System.

Figure 104. Graphene dress. The dress changes colour in sync with the wearer's breathing.

Figure 105. Descante Solar Thermo insulated jacket.

Figure 106. G+ Graphene Aero Jersey.

Figure 107. HiFlex strain/pressure sensor.

Figure 108. KiTT motion tracking knee sleeve.

Figure 109. Electroskin integration schematic.

Figure 110. Nextiles e-fabric.

Figure 111. Smardii smart diaper.

Figure 112. Teslasuit.

Figure 113. YouCare smart shirt.

I would like to order

Product name: The Global Market for Wearable Technologies 2021-2031

Product link: <https://marketpublishers.com/r/G848C2AAEDB6EN.html>

Price: US\$ 1,400.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

info@marketpublishers.com

Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/G848C2AAEDB6EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:
Last name:
Email:
Company:
Address:
City:
Zip code:
Country:
Tel:
Fax:
Your message:

****All fields are required**

Customer signature _____

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970