The Flexible Display Market is Expected to Reach $42 Billion by 2020

The flat-panel display market, represented by the LCD in the late 1990s, is looking forward to innovation advancement: The flexible display.

The flexible display is primarily defined as a display that uses a substrate made of flexible materials that are relatively unbreakable, instead of using breakable glasses. However, it ultimately refers to an “information display” that can replace papers and that can be designed in any form with a completely different form factor since it is thin, unbreakable, and rollable. The display industry has long developed flexible displays based on LCD, OLED, and e-paper technologies. As a result, a display that applies an unbreakable substrate, which is the primary form of a flexible display, is expected to be released within a few years.

“Flexible Display Technology Trend & Market Forecast (2012-2020),” issued by Displaybank, recently acquired by IHS Inc. (NYSE:IHS), analyzes the recent flexible display-related technology development and related companies' activities, as well as forecasts the flexible display market to 2020.

According to this report, the flexible display market is expected to grow from $1.1 billion in 2015 to $42 billion by 2020, accounting for 16% of the total flat display market. In addition, by shipment, the market is predicted to expand from about 25 million units in 2015 to about 800 million units in 2020, and sharply grow up to 13% of the entire market.

The flexible display market is expected not only to replace the existing display market, but also to lead the market growth by creating new display application markets. The alternative market is forecast to grow from about $500 million in 2015 to about $1.9 billion by 2020 and the new market from $600 million in 2015 to $2.2 billion by 2020.

The report also summarizes the development status of the world’s 100 companies and institutes that includes substrate/backplane/electrode-related technologies, materials, equipments, and prototypes for the commercialization of the flexible display. The report analyzes how close a flexible display is to the commercialization, by technology, such as LCD, OLED, and e-paper, and how the development will be progressed in the future.
Emerging Displays Report

Table of Contents

Chapter 1. Overview

Chapter 2. Flexible Display Overview

Chapter 3. Flexible Display Modes
3.1. Liquid Crystal Display
3.2. Organic Light-Emitting Diode Display
3.3. E-paper Display Technology

Chapter 4. Flexible Display Substrate Technologies & Key Issues
4.1. Flexible Display Substrate Overview
4.2. Requirements for Flexible Display Substrate
4.2.1. Thermal Stability
4.2.2. CTE (Coefficient of Thermal Expansion)
4.2.3. Gas Barrier Property
4.2.4. Flexibility & Durability
4.2.5. Optical Transmittance
4.3. Plastic Substrate
4.3.1. Polyethylene Terephthalate (PET)
4.3.2. Polyethylene Naphthalate (PEN)
4.3.3. Polycarbonate (PC)
4.3.4. Polyether Sulfone (PES)
4.3.5. Polyimide (PI)
4.3.6. Acrylate
4.3.7. Cyclic Olefin Copolymers (COC)
4.3.8. Composite Material Film (FRP)
4.4. Metal Foil for Flexible Display Substrate
4.5. Thin Glass
4.6. Transfer Technology
4.6.1. EPLaR Process (Philips)
4.6.2. Etching Stopper Process (Sony)
4.6.3. SUFTLA Process (Seiko-Epson)
4.7. Protection Film Technology
4.8. Key Issues for Flexible Substrate Technologies

Chapter 5. Flexible Display Transparent Electrode Technologies & Issues
5.1. Conventional Metal Oxide (ITO) & Flexible Transparent Electrode Overview
5.2. Requirements for Flexible Transparent Electrode
5.2.1. Transparent Properties of Transparent Electrode
5.2.2. Optical Properties of Transparent Electrode
5.2.3. Mechanical Stability & Flexibility of Transparent Electrode
5.3. Graphene Transparent Electrode
5.3.1. Definition of Graphene
5.3.2. Structure of Graphene
5.3.3. Properties of Graphene
5.3.3.1. Physical Properties
5.3.3.2. Chemical Properties
5.3.4. Graphene’s Transparent Electrode Application & Development Trend
5.4. Carbon Nanotube Material Technology
5.5. Conducting Polymer Material Technology
5.6. Ag Nanowire Material Technology
5.7. Flexible Display Transparent Electrode Key Issues

Chapter 6. TFT Technologies and Key Issues for Flexible Display
6.1. TFT Structure
6.2. Operation Principle of TFT
6.3. Requirements for TFT
6.3.1. Charge Transfer Property
6.3.2. Threshold Voltage Property
6.3.3. Contact Resistance Property
6.3.4. Temperature Property
6.3.5. Photoresponsive Property
6.4. Oxide TFT
6.5. Organic TFT
6.6. a-Si (Amorphous Silicon) TFT
6.7. LTPS (Low Temperature Poly Silicon) TFT
6.8. TFT Manufacturing Technology on the Plastic Substrate

Chapter 7. Flexible Display Manufacturing Technologies & Issues
7.2. Laser-Induced Thermal Imaging Technology
7.3. Inkjet Printing
7.4. Screen Printing
7.5. Roll-to-Roll Printing Process
7.5.1. Gravure Printing
7.5.2. Flexo Printing
7.5.3. Reverse Offset Printing
7.6. Imprinting Process and Equipment
7.7. Aerosol Deposition Process and Equipment
7.8. Manufacturing Technologies Issues for Flexible Display Manufacture

Chapter 8. Trend by Flexible Display Maker
8.1. Korea
8.1.1–18. AP Systems, Celli Industries, Doosan Electronics, Duksan Hi-Metal, i-Components, Ink-Tec, Jusung Engineering, KETI, KITECH, Kolon Industries, LG Chemical, LG Display, Narae Nanotech, Samsung Display(Samsung Electronics, Samsung Mobile Display) Liquavista, SFA, TERA-Semicon, VIATRON, WPM Business Unit for Substrate Materials of Flexible Display
8.2. Japan
8.3. The United States
8.4. Other Countries
8.4.1–12. AU Optronics, BMS, BP, E-Ink, Sipix Imaging, Entecell, Ferrania, ITRI, Merck, Nokia, Plastic Logic, Siemens, Wistron

Chapter 9. Flexible Display Market Forecast
9.1. Flexible Display Market Forecast
9.1.1. Display Mid- and Long-term Market Forecast
9.1.2. Flexible Display Mid- and Long-term Market Forecast
9.2 Alternative Market
9.2.1. Research on Alternative Market
9.2.2. Flexible Display Market Forecast (Alternative Market)
9.3. New Market
9.3.1. Research on New Market
9.3.2. Flexible Display Market Forecast (New Market)
10. Index