

# Research and Markets: LCD Processing: Challenges, Directions, Markets: Japan Dominating the LCD market

**Research and Markets has announced the addition of LCD Processing: Challenges, Directions, Markets to their offering.**

**This technology-marketing report examines and projects the technologies involved in the fabrication of Liquid Crystal Displays (LCD),** their likely developments, why and when their or demise will take place, what problems and choices are facing users, and where the opportunities and pitfalls are. This report discusses the technology trends, products, applications, and suppliers of materials and equipment. It also gives insights to suppliers for future user needs and should assist them in long-range planning, new product development and product improvement. While the Japanese dominates the LCD market, the race for the \$8 billion equipment and materials market by 2003 is still wide open to U.S. and European players.

While much of the LCD market is not growing like the semiconductor market, the Active Matrix LCD (AMLCD) is poised for explosive growth, necessitating the need for equipment and materials.

With the Japanese dominating LCDs production nearly since the start, it is not surprising that Japanese vendors supply the majority of production equipment and materials.

Yields on TFT displays in Japan are low -- only two 12.1-in. panels on a sheet of second-generation motherglass, compared with six 10.4-in. panels on the same size glass substrate. New third-generation plants can make six 12.1-in. panels on a substrate, but yields have been low due to technical problems upgrading to the new production technology.

Costs of current AMLCDs are too high for most applications. Parts and materials for FPDs is 38%, compared to 20% for ICs. The total number of parts needed to fabricate an LCD is 50 times that of an IC.

- Japan is dominating in investment and implementation in manufacturing compared to the U.S.
- Japan is leading in product development and is expanding its lead
- Japan is currently even with the U.S. in basic research but is gaining

Although used regularly for high-end computer systems in the U.S., Europe, and Japan, and in military applications, the extension of the market beyond the realm of high-cost, low-volume systems is affected by several factors:

Limited high-volume applications

Low production volume

Low yields on third-generation motherglass

High facility capitalization

Important issues addressed include:

- Yields must be improved

- Processing capacity must achieve a ten-fold increase
- Material costs must be reduced
- Will the U.S. build displays that will fuel local demand for equipment and materials?
- Customers are in Japan, and vendors must develop strategic partnerships there

This report is written for:

- Marketing and Product Managers
- Strategic Planners
- Systems and Circuit Engineering Managers in ICs, Packaging, Test, Assembly, and Materials
- Investment Analysts

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Companies Profiled

Anelva, Applied Materials, Komatsu Ltd., Canon, Dainippon Screen Manufacturing, Fine Machining, Fuji Photo Film, Ishikawajima-Harima Heavy Industries, Japan Vacuum Technology, Kawasaki Heavy Industries, Kokusai Electric, Lasertec, NEC, Nikon, NTN, Plasma Systems, Shibaura Engineering, Shibuya Electric, Shimadzu, TEL, Tokyo Electronic Industry, Yokogawa Electric, Asahi Glass, Canon, Dainippon Ink & Chemicals, Dai Nippon Printing, Fuji Photo Film, Konica, Merck Japan, Mitsubishi Chemical, Mitsubishi Gas Chemical, Mitsuya Electronics, NH Technoglass, Nippon Electric Glass, Nippon Petrochemicals, Nippon Sheet Glass, Nisshogiken, Nitto Denko, Sanritz, Teijin, Tokyo Ohka Kogyo, Toppan Printing, Toray, Casio, Citizen, Denso, Giant Technology Corporation, Hitachi, Hosiden, IBM Japan, Iiyama Electric, Io Data Device, Kyocera, Mitsubishi, Nippon Telegraph And Telephone, Optrex, Sanyo, Seiko-Epson, Sharp, Sony, Stanley Electric, Toshiba Matsushita Display Technology, Accudyne, Applied Materials, Komatsu, Atkis, Axic, Brooks Automation, CFM Technologies, Display Inspection Systems, FAS Technologies, FSI International, High Temperature Engineering, Hornell Engineering, Interlab, Interserv, KLA Acrotec, Lam Research, Leybold Inficon, Opto-Mechanics, Photon Dynamics, Photonics, Sloan Technology, Spectrum Sciences, Corning, Donnelly, Dow Chemical, General Motors Research Laboratories, Elecsys Corporation, David Sarnoff Research Center, DpiX, Philips, Siemens, Thales, Planar, Varian, Xerox, Displaytech, Imagequest Technologies, In-Focus Systems, Kopin,

Three-Five Systems, U.S. Display Consortium, Holtronic Technologies S A, Hugel Lithography, Karl Suss, LG Group, Micronic Laser Systems, Coretronic, K-Bridge, LG Chemicals, LG Micron, Merck, Optimax Technology, Radiant, Terapixel, AU Optronics, Beijing Orient Electronics, Chi Mei Industrial, Chunghwa Picture Tubes, ERSO, Gec-Marconi, Grand Pacific Optoelectronics, Hannstar Display, Innolux Display, Jilin, Toshiba Corp, Ibm Corp, Korea Electronics, Lancer Displaytech, LG, Philips LCD, Nan Ya Plastics, Orion Electric Co, Picvue Electronics, Prime View International, Quanta Display, Samsung, Solomon Goldentek Display, Teco Optronics, Thomson SA, Thorn EMI, Tianma Microelectronics, Toppoly

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