UV/EB Market and Business Status in Japan

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Abstract
In 2007, the world and Japanese economies have continued to grow. The electronics and IT industries strongly promoted this growth. The market expansion of these industries drives the expansion of semiconductors, electronic components and display devices, and following this trend, UV/EB market has also been experiencing a continuous growth. This paper reviews UV/EB market and business status, and technical topics in Japan.

1. Introduction
The world economy has continued to grow stably in the first half of 2007, although there is an U.S. economic slowdown due to housing investment adjustments, rising oil prices worldwide and soaring prices of raw materials around the world and so on. The stable growth is attributed to factors such as steady economic growth in Europe, and continuous high economic growth in the BRICs, in particular the People's Republic of China, and other emerging economies.

According to a report by the Japan Electronics and Information Technology Industries Association (JEITA) [1], global production by the electronics and IT industries (electronics industry and IT solution services) is estimated to increase 8% year-on-year in 2007, to $2.07 trillion, as shown in Figure 1. Electronics industry production (electronic equipment, electronic components and devices) is estimated to grow 8% year-on-year, to $1.61 trillion. The main contribution to the high growth is from AV equipment, computers and information terminals, and flat-panel-display (FPD) TVs. The market expansion for these industries also drives the expansion of semiconductors, electronic components, display devices and materials.

The global production by Japanese electronics and IT industries, including overseas production, is estimated to increase 5% in 2007, to $451 billion as shown in Figure 2. Global electronics production by Japanese industry is also expected to rise 5% in 2007, to $401 billion. Japanese

industry is maintaining an important position in a globalizing world. A comparison of the annual growth of global productions between by the world and by Japan shows that Japan is 3% behind the world in 2007.

2. Market Overview of Raw Materials and their Applications

A Japanese market overview of raw materials for UV/EB curing and of applications is summarized in Table 1 and 2, respectively, as reported by T. Yamadera at Radtech Expo, China in May 2006[2]. The update of Japanese market overview for raw materials for UV/EB curing was published by CMC in June 2007, under the title “Market & Prospect of UV/EB Radiation Curing Materials and Products” [3]. The updated Japanese market overview will be presented next May in Chicago.

2.1 Raw Materials for UV/EB Curing

These days, it is not easy to develop new chemicals because it needs much investment to integrate the safety data of chemicals, sought by developers worldwide. However, the electronics industry requires the development of new chemicals for UV/EB curing for its growth. In order to realize this requirement, it is very important for the materials industry to collaborate with the device or system industry. I hope the Radtech Technical Conference will give us such an opportunity.

2.2 Applications for UV/EB Curing

The technology of radiation curing consists of industries for irradiation source and equipment, chemicals, formulation, processing and so on [4]. It seems that the technology in Japan is stronger than that in other countries worldwide, because the whole industry for radiation curing is in Japan. By making great progress with the performance and functionality of chemicals for UV/EB curing, the UV/EB curing technology has expanded its application fields in leading edge industries. I would like to show you representative applications in Chicago in May.

3. Technology Overview

To understand recent UV/EB technology, it is helpful to look at what is going on in some cutting-edge application fields. I would like to explain to you technologies for display, semiconductor, PCBs (printed circuit boards), opto-electronics and new technologies for UV/EB curing at my presentation in Chicago.

Acknowledgement

The author would like to acknowledge RadTech Japan for giving me an opportunity to report the overview of the Japanese UV/EB market.

References

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[3] Market & Prospect of UV/EB Radiation Curing Material and product, CMC (2007).
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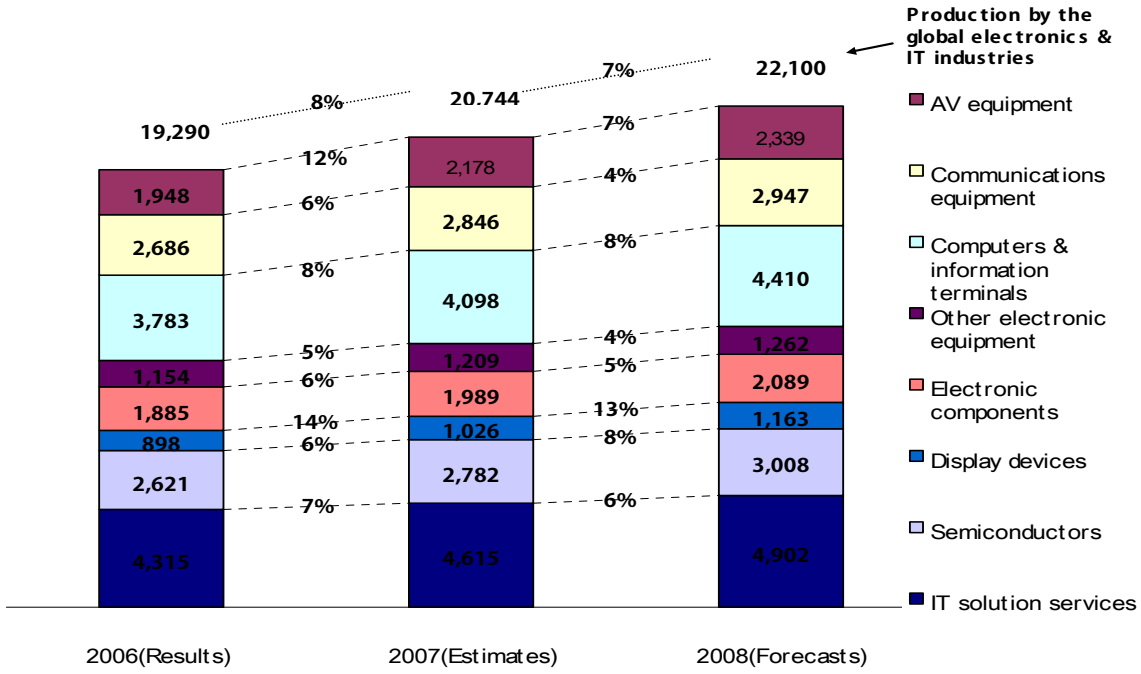

Figure 1 . Production by the Global Electronics and IT Industries ($ 100M; %change YoY)
(reported by JEITA)

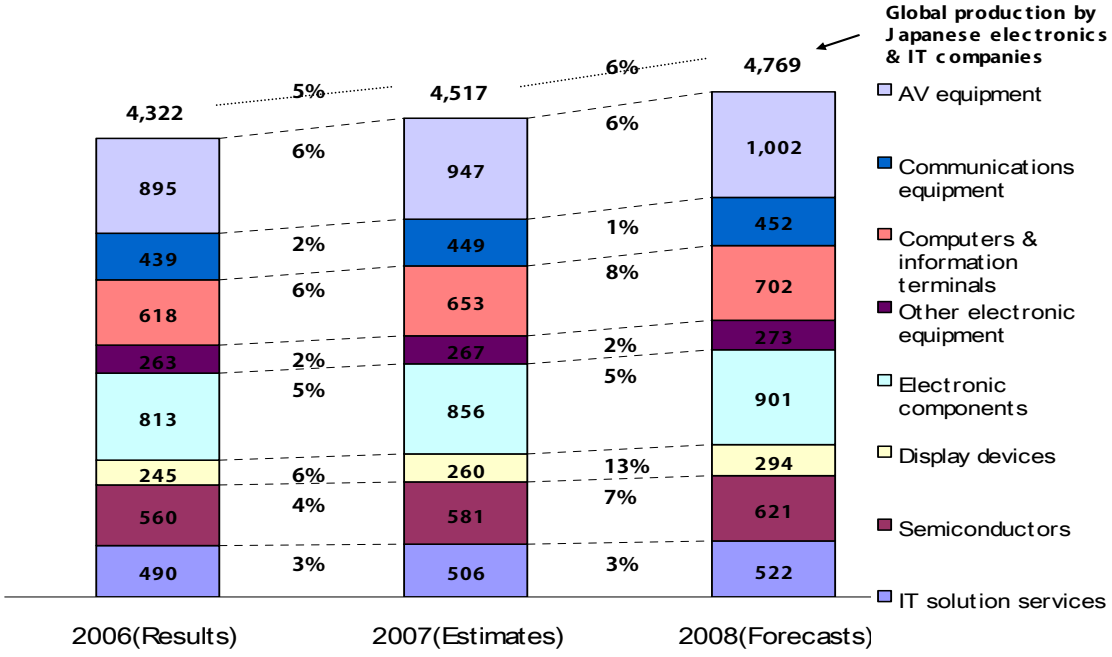

Figure 2 . Global Production by Japanese Electronics and IT Companies ($ 100M; %change YoY)
(reported by JEITA)

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Material	2002	2003	2004	2005	2006	2007	Applications
Reactive Diluents	16,300	18,800	20200	20900	22,040	**23,240**	Not specified
Mono Acrylates	2,300	2,900	3,200	3300	3,400	**3,500**	Coatings, OP varnishes
Di Acrylates	4,000	4,600	5,000	5,100	5,360	**5,630**	Coatings, OP varnishes
Multi Acrylates	6,200	7,000	7,400	7,500	7,880	**8,280**	inks, Hard coat, Resists
Methacrylates	500	600	700	800	900	**1,010**	Dry films
Others	800	900	1,000	1,100	1,200	**1,310**	Not specified
For synthesis	2,500	2,800	2,900	3,100	3,300	**3,510**	Oligomer synthesis
Oligomers	14,600	15,330	16,320	17,200	18,300	**19,560**	
Epoxy Acrylates	4,200	4,600	5,000	5400	6,000	**6,670**	Solder resists
Urethane Acrylates	4,100	4,600	5,200	5700	6,300	**6,960**	Optical fiber coatings
Polyester Acrylates	2,750	2,800	2,800	2800	2,800	**2,800**	Wood coatings
Other Acrylates	750	830	920	1,000	1,100	**1,210**	Not specified

Unsat. Polyester	2,800	2,500	2,400	2,300	2,100	**1,920**	Wood coatings
Photoinitiators	1,550	1,700	1,800	1,900	2,000	**2,110**	
Total	32,450	35,830	38,320	40,000	42,340	**44,910**	
*Based on 2006 AGR							

Table2 Market overview for UV/EB materials by application Ton/Year

Application	2002	2003	2004	2005	2006	2007
Coatings	16,290	16,210	16,660	17,440	18,130	18,880
Wood coatings	7,400	7,200	7,200	7,400	7,500	7,600
PVC floor coatings	700	700	700	700	700	700
Filmcoatings	480	580	700	840	1,010	1,210
Metal coatings	280	270	260	250	250	250
Vac. Dep.&Hard coats	2,800	3,400	4,100	4,300	4,500	4,710
Optical disk coatings	560	570	580	590	580	570
Optical fiber coatings	2,300	1,610	1,130	1,260	1,380	1,510
Ceramic coatings	1,500	1,600	1,700	1,800	1,900	2,010
Release coatings	270	280	290	300	310	320
Inks	9,200	9,520	9,820	10,120	10,470	10,840
Offset inks	6,400	6,600	6,800	7,000	7,200	7,410
Gravure inks	1,340	1,400	1,450	1,500	1,600	1,710
Metal coating ink	800	800	800	800	800	800
Silk screen inks	530	560	590	620	650	680
Flexo inks	130	160	180	200	220	240

Resists	15,120	16,700	18,580	20,470	22,720	**25,800**
Dry film resist	2,300	2,400	2,500	2,500	2,500	**2,500**
Liquid resisit	5,800	6,000	6,200	6,400	6,600	**6,810**
Electro-deposition resist	320	350	380	420	420	**420**
Resist for LCD	1,800	2,100	2,400	2,700	2,900	**3,110**
Barrier for PDP	400	1,000	2,100	3,200	4,800	**7,200**
Semiconductor resist	2,600	2,900	3,000	3,200	3,400	**3,610**
Photo polymer plate	1,900	1,950	2,000	2,050	2,100	**2,150**
Others	1460	1670	1770	1880	1990	**2110**
Rapid prototyping	60	70	70	80	90	**100**
Adhesives	1400	1,600	1,700	1,800	1,900	**2,010**
Total	42,070	44,100	46,830	49,910	53,310	**57,630**
*Based on 2006 AGR						