

Capacitive Touch Panel Modules & Materials Market 2011

 Yano Research Institute Ltd.

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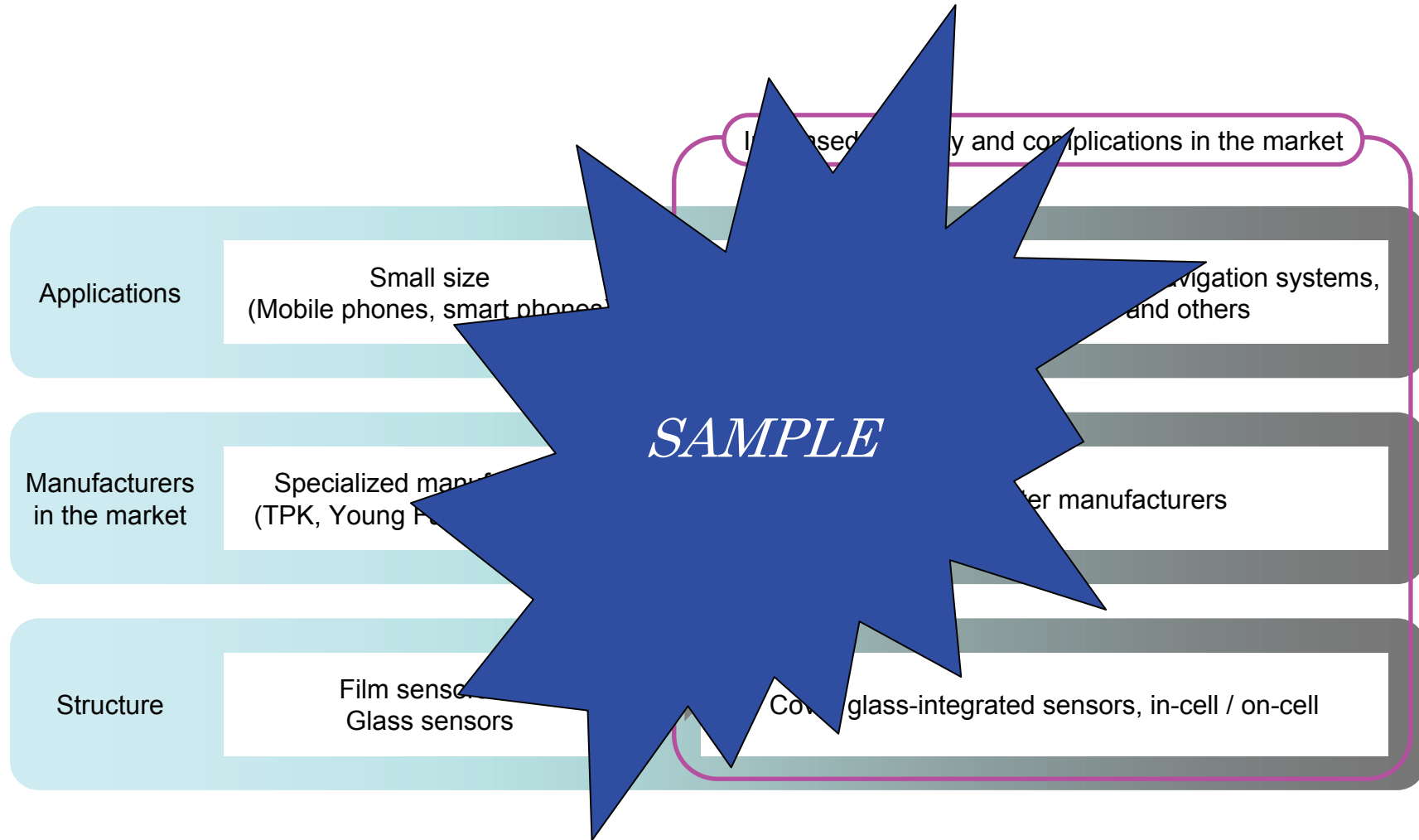
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1-1. Changes in the capacitive touch panel market



1-2. Capacitive TP market trends

Greater diversity in required specifications for materials and components, driven by increased applications
Important to identify user preferences and competitor trends in responding to changes

- Demand exists for use not only in mobile phones and smart phones but also in tablet terminals. In addition, there is keen interest in adopting capacitive TPs for digital cameras and car navigation systems.
- While glass sensors and film sensors have been adopted in mobile phones and smart phones, the weight of the glass can be a bottleneck for glass sensors in tablet terminals. Therefore, efforts are underway to minimize the weight of sensor substrates, change glass sensor substrates to those made with film substrates, and develop cover glass-integrated sensors. Additionally, in terms of manufacturing methods and materials for lead-free solder, efforts are underway to develop cover glass-integrated sensors.
- Although adoption in car navigation systems is still in the product assessment process, capacitive TPs are expected to be used in genuine products in 2012. While the glass sensors will be used for car navigation systems, efforts are required to improve the environmental resistance (humidity, temperature, etc.) of capacitive TPs for car navigation systems.
- Digital cameras, given their low weight and low power consumption, are using capacitive TPs, although the need is apparent. Film sensors are still used for outdoor use, sensors must be of a low-reflective nature.
- Amid changes in capacitive TPs in terms of application and size, the weaknesses in materials currently used are prone to stand out. It is possible that new materials and components for use as alternatives will promote market expansion.
- It is important for component and material manufacturers to grasp user preferences and competitor trends in pursuing development and enhancement efforts accordingly at this point in time when the market is showing rapid expansion and innovation.

1-3. Product lineups and lead wire formation methods of capacitive TP manufacturers

	Glass sensors	Film sensors	Lead wire formation method
CMI	⊙	⊙	Printing
AUO			—
Cando			—
Sintek	⊙		—
TPK			Currently printing. The possibility of adopting other methods is low.
Wintek			—
Hitachi Displays			—
Young Fast			Currently printing. Other methods are under development.
J touch			Currently printing. Partially sputtering?
SWENC			Currently printing. Other methods are under development.
EELY	Un		Printing
Nissha Printing			Currently printing. Other methods are under consideration.
ALPS ELECTRIC			Metal sputtering
DNP		⊙	Metal sputtering

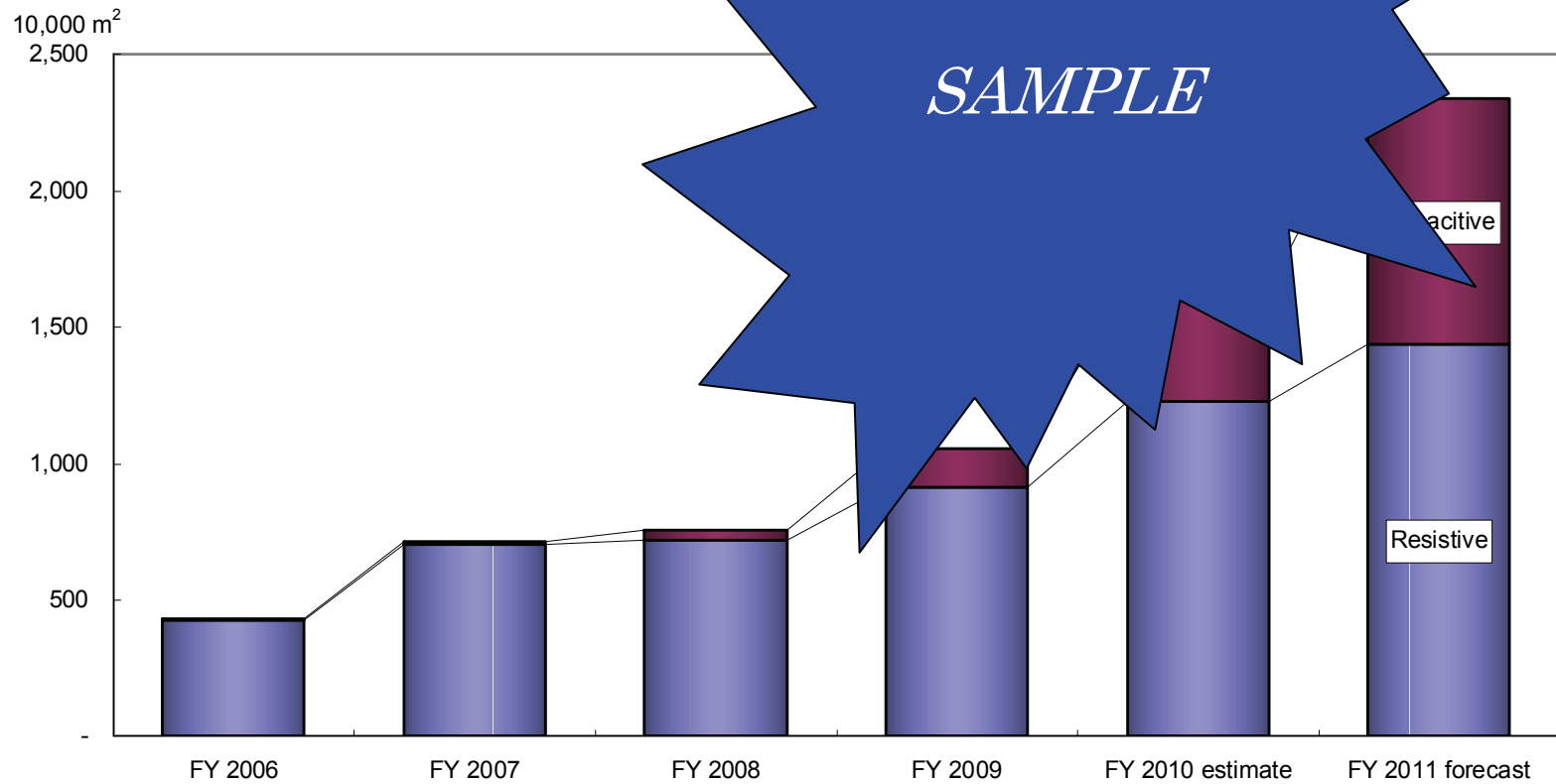
* ⊙: main, ○: lineup, △: available but in low volume, ×: no lineup, —: unrelated or unknown

[Prepared by Yano Research Institute (Presumption partially included.)]

2-1-2. Market size of ITO films

(Unit: 10,000 m²)

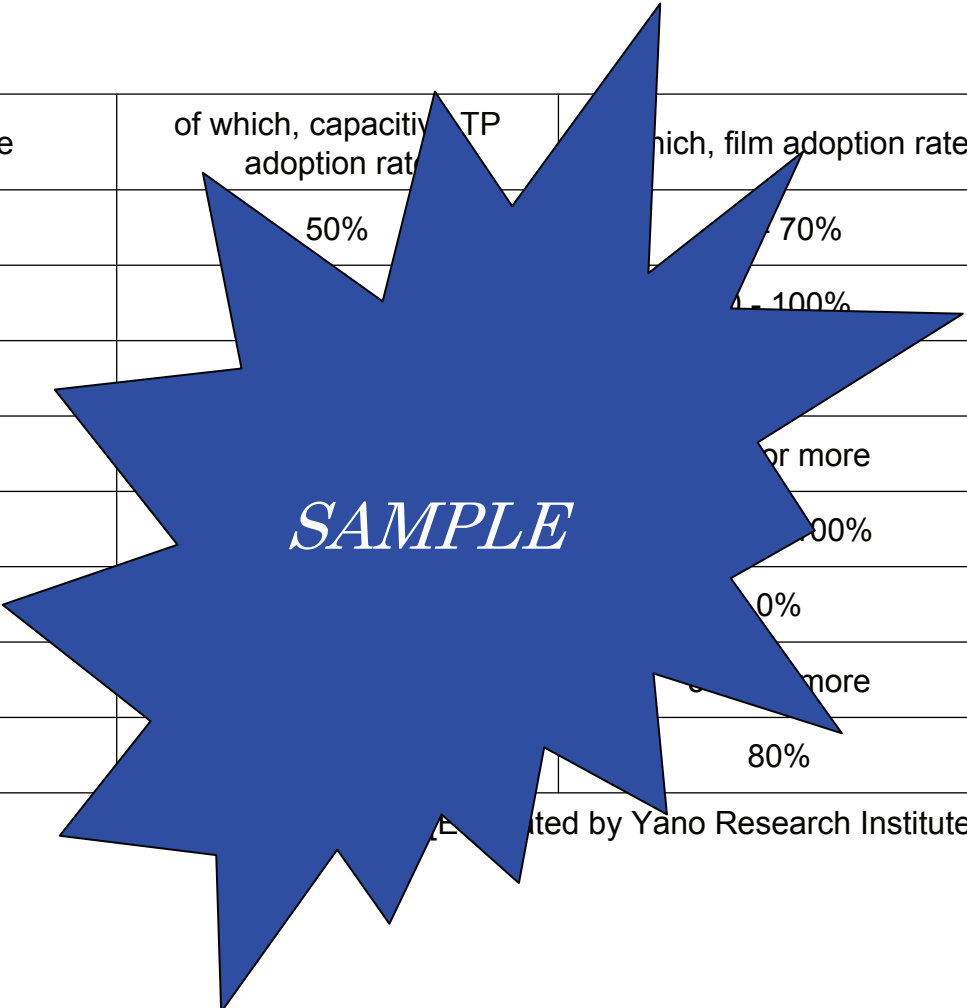
	FY 2006		FY 2007		FY 2008		FY 2009		FY 2010 estimate		FY 2011 forecast	
		Ratio to total		Ratio to total		Ratio to total		Ratio to total		Ratio to total		Ratio to total
Resistive	426	98.8%	704	98.6%	719	947.0%	1,046	94.0%	1,437	61.5%	1,437	61.5%
Capacitive	5	1.2%	10	1.4%	40	5.3%	70	9.3%	900	38.5%	900	38.5%
Total	431	100.0%	714	100.0%	759	100.0%	1,116	100.0%	2,337	100.0%	2,337	100.0%



[Estimated by Yano Research Institute]

2-1-6. Adoption rates of TPs, capacitive TPs and film sensors of major manufacturers of mobile phones and smart phones

	TP adoption rate	of which, capacitive TP adoption rate	of which, film adoption rate
Nokia	15%	50%	70%
Samsung	45%		100%
LG	50%		
Sony Ericsson	20%		or more
Motorola	50%		100%
Apple	100%		0%
RIM	Almost 100%		or more
HTC	Almost 100%		80%

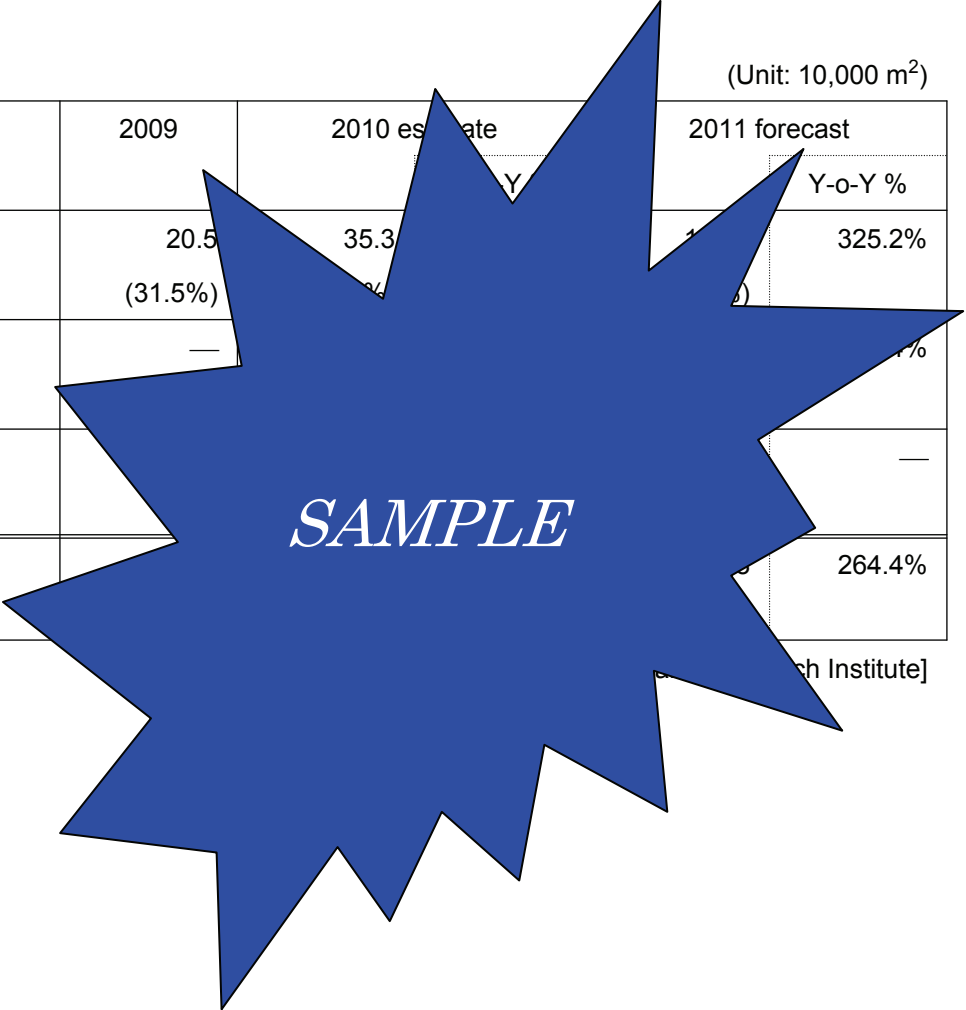


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2-2-4. Market size of ITO glass for capacitive TPs

(Unit: 10,000 m²)

	2009	2010 estimate	2011 forecast	Y-o-Y %
For mobile phones and smart phones (Ratio to total)	20.5 (31.5%)	35.3 (54.8%)	111.5 (169.2%)	325.2%
For tablet terminals (Ratio to total)	—	—	—	—
Others (Ratio to total)	—	—	—	—
Total (Ratio to total)	—	—	—	264.4%



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2-2-5. Analysis on the market of ITO glass for capacitive TP sensors

- As of 2009, the only type of ITO glass for capacitive TP sensors available in a reasonable quantity was the glass for mobile phones and smart phones.
- As the iPhone from Apple (U.S.) was a hit, other mobile phone manufacturers moved to enhance their lineups of smart phones with capacitive TPs. In 2010, many products with capacitive TPs were launched, including Galaxy S from Samsung (South Korea), Droid Eris and Droid Incredible from HTC (Taiwan), and Droid from Motorola (U.S.).
- The rise in the number of smart phones does not imply the demand volume for ITO glass, as it is estimated that until 2010, many smart phones used film sensors. Subsequently, sensor manufacturers have increased their capacity and cost reduction. It is projected that in 2011, more smart phones will use glass sensors in applications other than the iPhone will be used.
- Tablet terminals, as they tend to be used for a long time of the display and are often used while in transit, are required to be lightweight and thin. Existing applications such as smart phones and notebook PCs will be adopted. While Apple's iPad uses the glass sensor, Samsung's Galaxy Tab uses the film sensor. If the need for lighter weight is considered, it is likely that the iPad will also shift to using the film sensor.
- Going forward, the use of glass sensors will be categorized depending on size and application. It is expected that small size sensors, such as smart phones, will primarily utilize glass sensors. Medium size sensors are expected to be used in automotive-related application such as navigation systems on which capacitive TPs will be used in the near future. This is given that such application even with resistive TPs generally used G/G.

2-2-8. Production capabilities of glass sensor manufacturers

	Plant	Plant locations	Manufacturing machines/ systems	Capacity		Remarks
				2010	2011	
TPK (20% owned by Balda AG of Germany)	Xiamen Plant	Xiamen City, Fujian Province, China	2nd generation 2.5th generation	5 million sheets per month (3.5 inches)	8 million sheets per month (4 inches)	The new machine is 3rd generation; scheduled to start operation by the end of 2010.
Wintek	Taichung Plant	—	3rd generation	0.5 million sheets per month	→	The China Plant began operation in September 2010. It is expected to expand its capacity to produce 3.0 to 3.5 million sheets per month in the first half of 2011.
	China Plant	Dongguan City, Guangdong Province, China		1.5 million sheets per month	→	
Sintek (Member of the HannStar Display Group)	Tainan Plant	Sinshih Township, Tainan County	5.3rd generation			Expected to install the 4.5th-generation machine by the end of 2011.
Cando (Member of the AUO)	Suzhou Plant	Suzhou, China				Expected to have performed mass-production using the 4.5th-generation machine in September 2010.
	Taichung Plant	Taichung, Taiwan				Currently under construction.
Chimei Innolux (Member of the Foxconn Group)	China Plant	Shenzhen, Guangdong, China				Maintains LCD lines of 2.5th to 8th generation. Will continue to expand and may take the opportunity of installing another LCD line or a new line for TPs.
	Xin Zhu Plant	Taoyuan County, Taiwan				
AUO	Longtan Plant	Taoyuan County, Taiwan		1 million sheets per month (Substrate size)	1.5 million sheets per month (Substrate size)	Completed improvement for the second line (4th generation) to convert from a LCD line. Commencement of operation is scheduled for January 2011.
CPT	Longtan Plant	Taoyuan County, Taiwan	4.5th generation	1 million sheets per month (Medium and small size)	→	Will appropriate 70% of the production line for TPs and is expected to expand its capacity to 3 million sheets per month during the current fiscal year.

[Estimated by Yano Research Institute]

2-3-2. Capacitive TP cover lens market size

(Unit: 10,000 m²)

	2009	2010 estimate	2011 forecast	Y-o-Y %
For mobile phones and smart phones (Ratio to total)	65.0 (100.0%)	81.0 (124.6%)	173.0 (213.6%)	215.2%
For tablet terminals (Ratio to total)	—	—	—	—
Others (Ratio to total)	—	—	—	—
Total (Ratio to total)	—	—	2	302.6%

SAMPLE

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2-4-2. OCA

Optical transparent filler market size (OCA type)

(Unit: 10,000 m²)

2007	2008		2009	FY 2010 (forecast)
	Value	Y-o-Y %		
Partially available	50	—	70	

* OCA of 100 μm or above; including OCA used in applications.

SAMPLE

- OCA is composed of a light removable material used for bonding components (e.g. one film sensor with another; cover film with LCD panel, etc.). Thin OCA (50 μm) is used for bonding flat-shaped components (e.g. LCD panels and cover glass), a thicker adhesive with the thickness primarily of 100 μm or more is used for bonding curved components (e.g. mobile phones and tablet terminals).
- OCA of thin materials are supplied in rolls which are cut and punched in accordance with the shape and size of the components (e.g. LCD panels, mobile phones and tablet terminals).
- The types of OCA described in this report are those with a thickness of 100 μm or more used to bond flat-shaped components. Thin OCA materials (25 to 50 μm) applied to bond film components using the Roll to Roll technique are used for an extremely wide range of applications including LCD polarizers and PDP optical filters, plus it is difficult to identify even by OCA manufacturers as to what applications the OCA materials shipped are actually used for.

2-5-6. Conductive paste market size and manufacturer shares

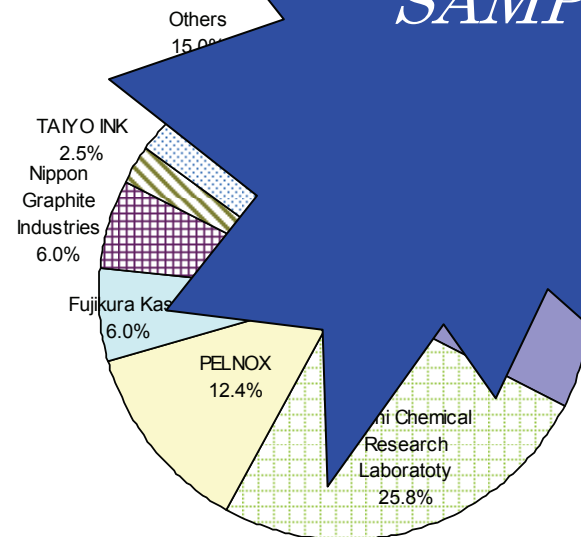
Conductive paste market size by type of TP

(Unit: kilograms)

	FY 2009	FY 2010 (estimate)		FY 2011 (forecast)	
			Y-o-Y %		Y-o-Y %
Resistive TPs	77,000	87,500	113.6%	87,500	100.2%
Ratio to total	—	90.4%		90.4%	
Capacitive TPs	Partially	9,820	12.7%	9,820	423.0%
Ratio to total	—	10.1%		10.1%	
Total	77,000	97,320	126.3%	97,320	132.5%

[Estimated by Yano Research Institute]

Manufacturer shares in



* "Others" include TOYO INK, Harima Chemicals, Du Pont and others.

* Shares include conductive pastes for resistive and capacitive TPs.

[Estimated by Yano Research Institute]

2-5-7. Market overview

Conductive paste market to expand to 130% Y-o-Y in FY 2011
Capacitive segment of the market is expected to quadruple from FY 2010

- During FY 2010, smart phones and other applications with TP have been increasing, and the overall TP market has been on a growth trend. Therefore, the market of conductive paste for TPs is expected to expand to 124.8% year-on-year to 96.5 tons.
- As the TP market is expected to continue to grow in FY 2011, the conductive paste market is estimated to expand to 132.5% year-on-year to 127 tons. Meanwhile, depending on the needs of the market, capacitive sensors might be more actively adopted for capacitive TPs in which the conductive paste market may slow down against the growth of the overall TP market.
- Looking at the market by TP type, the market of resistive TPs in FY 2010 are expected to grow to 112.8% year-on-year to 81.5 tons. Shipments of resistive TPs as well as capacitive TPs are expected to remain stable. However, that shipments for FY 2011 will stay almost flat from 81.5 tons. The adoption rate for capacitive TPs is projected to increase, but the market of resistive TPs will be stagnant.
- The market of conductive paste for capacitive TPs is expected to be about 9 tons for FY 2010. With greater demand for capacitive sensors, the market in FY 2011 is estimated to quadruple from the previous year to 36 tons. Some projections show that in terms of the number of units, conductive pastes for capacitive TPs in FY 2011 will account for approximately 40% of the overall conductive paste market. However, as the actual volume used is expected to decline given the enhanced fineness of lead wires, the rate of growth of the conductive paste market will presumably be not as high as the rate of increase in the number of units.

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