

# A smart focus meets evolving market needs



# Financial Highlights

	(millions of yen)										
Years ended March 31 or as of March 31	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Net sales	564,286	604,865	655,792	657,853	795,180	862,025	866,285	727,400	808,858	871,943	<b>814,497</b>
(Overseas sales)	399,508	439,381	487,169	473,828	621,522	690,673	714,172	610,944	704,874	763,046	<b>702,469</b>
Cost of sales	463,331	459,552	476,407	484,323	585,780	622,819	635,529	605,943	617,776	654,180	<b>634,257</b>
Selling, general, and administrative expenses	115,696	115,569	122,875	119,886	142,052	159,106	158,921	159,878	160,386	153,442	<b>161,715</b>
Transfer to the government of the substitutional portion of the Employees' Pension Fund:											
Subsidy from the government				(33,533)							
Loss on settlement				27,347							
Gain on sales of business to Imation Corp.							(15,340)				
Restructuring cost	25,489	5,197	—	—	6,825	510	—	15,884	4,922	—	—
Production realignment costs											<b>6,570</b>
Realignment-related gain; Sale of properties											<b>(6,732)</b>
Operating income (loss)	(40,230)	24,547	56,510	59,830	60,523	79,590	87,175	(54,305)	25,774	64,321	<b>18,687</b>
Income (loss) before income taxes						88,665	91,505	(81,630)	21,907		
Income (loss) from continuing operations before income taxes	(40,230)	20,552	55,847	60,728	66,103					60,620	<b>12,245</b>
Income taxes	(15,679)	6,193	12,133	23,284	21,057	16,985	19,948	(17,041)	9,025	15,105	<b>11,486</b>
Loss (income) from discontinued operations	2,152	1,574	1,254	3,665	310					(511)	<b>(2,460)</b>
Net income (loss) attributable to TDK	(25,771)	12,019	42,101	33,300	44,101	70,125	71,461	(63,160)	13,520	45,264	<b>(2,454)</b>
<b>Per common share (Yen):</b>											
Net income (loss) attribute to TDK basic	(193.91)	90.56	317.80	251.71	333.50	529.88	551.72	(489.71)	104.82	350.90	<b>(19.06)</b>
Net income (loss) attributable to TDK diluted	(193.91)	90.56	317.69	251.56	333.20	529.29	551.19	(489.71)	104.74	350.57	<b>(21.42)</b>
Net cash flow	264.94	521.05	700.46	650.47	775.50	1,022.45	1,101.11	204.75	753.83	948.98	<b>601.68</b>
Net assets	4,395	4,176	4,352	4,832	5,311	5,759	5,557	4,297	4,215	4,142	<b>3,957</b>
<b>Dividends per common share (Yen)</b>											
	50.00	50.00	55.00	70.00	90.00	110.00	130.00	130.00	60.00	80.00	<b>80.00</b>
Payout ratio (%)	—	55.2	17.3	27.8	27.0	20.8	23.4	—	57.2	22.8	—
Total assets	749,910	747,337	770,319	808,001	923,503	989,304	935,533	1,101,036	1,091,458	1,060,853	<b>1,072,829</b>
Stockholders' equity	583,927	553,885	576,219	639,067	702,419	762,712	716,577	554,218	543,756	534,273	<b>498,159</b>
Working capital	288,865	315,948	360,555	379,746	397,131	449,830	300,859	281,536	286,370	199,186	<b>219,918</b>
Capital expenditures	58,347	41,026	44,471	61,005	73,911	70,440	84,312	98,425	64,370	78,638	<b>99,653</b>
Depreciation and amortization	60,981	57,132	50,726	52,806	58,540	65,337	71,297	89,567	83,788	77,264	<b>79,918</b>
Research and development	35,530	30,099	32,948	36,348	45,528	50,058	57,387	57,645	53,942	52,608	<b>52,551</b>
<b>Ratio of overseas production to net sales (%)</b>											
	53.3	55.8	58.6	59.0	61.7	62.2	70.1	74.0	80.6	83.7	<b>80.2</b>
Number of employees	32,249	31,705	36,804	37,115	53,923	51,614	60,212	66,429	80,590	87,809	<b>79,175</b>

Notes: 1 TDK has adopted the Emerging Issues Task Force Issue 01-9 ("EITF01-9"), "Accounting for Consideration Given by a Vendor to a Customer (Including a Reseller of the Vendor's Products)," since the fiscal year beginning April 1, 2002. As a result, figures for the fiscal year ended March 31, 2002, have been reclassified to conform to the fiscal year ended March 31, 2003 presentation.

2 Effective from fiscal year ended March 31, 2012, TDK has shown earnings related to the display business as discontinued operations in the consolidated statements of operations, in accordance with the provisions of Accounting Standards Codification ("ASC") Subtopic 205-20, "Presentation of Financial Statements—Discontinued Operations," issued by the U.S. Financial Accounting Standards Board ("FASB"). Consequently, fiscal year ended March 31, 2011 figures have been restated to match the presentation in fiscal year ended March 31, 2012.

## Profile

## History of TDK

1935

## Invention of ferrite is the starting point

Tokyo Denki Kagaku Kogyo K.K. (later renamed TDK) was founded for the commercialization of ferrite, a groundbreaking magnetic material invented in Japan. Ferrite was developed by Drs. Yogoro Kato and Takeshi Takei of the Tokyo Institute of Technology. TDK is a pioneering university-initiated venture.



The world's first ferrite cores

2009

## Recognition as IEEE Milestone

Work by the Tokyo Institute of Technology and TDK to develop ferrite materials and their applications received recognition from the Institute of Electrical and Electronics Engineers (IEEE), an international academic society relating to electricity and electronics as an IEEE Milestone, commemorating historic achievements in electric and electronic technology. Since the establishment of the award in 1983, this was the 89th IEEE Milestone worldwide and the 10th in Japan.



The IEEE Milestone plaque

2011

## TDK Develops Metal Magnets that Require Far Lower Amounts of Rare Earth Elements

Rare earth metals are produced by very few countries, so it is difficult to procure a stable supply. TDK has developed a new method for manufacturing metal magnets that requires less than half the amount of dysprosium, a rare earth element. Development is also currently underway on new technologies to produce entirely dysprosium-free magnets.

Metal magnets



1930

1940

1950

1960

1970

1980

1990

2000

2010

2011

1966

## Development of the first Japanese-made cassette tape

TDK developed the first Japanese-made cassette tape, greatly transforming music life. The phenomenal success of the tape led to TDK becoming a household name throughout the world.



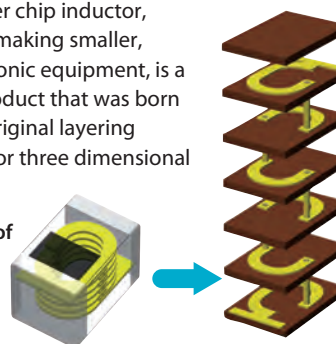
The Synchro cassette tape, Japan's first domestically made cassette tape

1980

## Development of the multilayer chip inductor

The multilayer chip inductor, essential for making smaller, lighter electronic equipment, is a landmark product that was born from TDK's original layering technology for three dimensional spiral coils.

The structure of a multilayer chip inductor

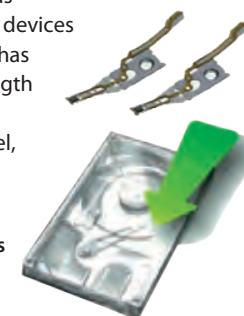


1994

## Launch of high-density recording MR magnetic heads for HDDs

Hard disk drives (HDDs) are used as large-capacity recording media in devices such as personal computers. TDK has world-leading technological strength in the field of magnetic heads for HDDs, which require nano-level, thin-film technology.

A magnetic head for HDDs

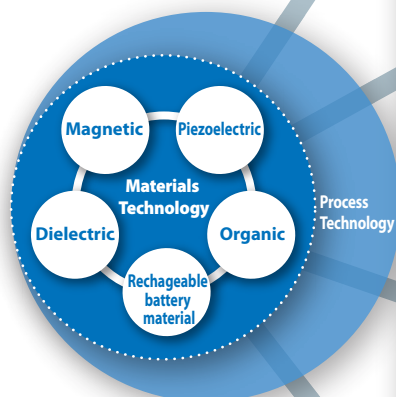


## Profile

## Guide to Our Businesses

TDK continues to develop progressive, creative technologies based on materials technologies derived from the magnetic material ferrite, process technologies for manufacturing minute devices and other core technologies. These technologies take form as electronic components for a wide range of industrial fields and contribute to both progress in the electronics industry and advancements in a highly-sophisticated information society. In recent years TDK has been focusing on areas that will continue to be in high demand worldwide, such as telecommunications, home information appliances, automobiles, and industrial equipment/energy. We have conducted R&D and developed technologies to solve issues being faced in these fields, and have strived to expand through new advanced technologies and products acquired through corporate M&A activities.

An emerging synergy between TDK's core technologies and newly acquired advanced technologies has led to smartphones becoming smaller and more multifunctional, data centers saving energy, automobiles becoming more environmentally friendly, and an evolution to smart cities of the future. TDK's technological innovation is leading to greater abundance throughout the world.



## Growth Areas

## Communications

1

- SAW filter
- RF module
- Ceramic Filter
- MEMS microphone
- Multilayer ceramic chip capacitor
- SMD inductor
- Thin-film common mode filter
- Multilayer chip varistor
- Noise suppression sheet
- Power module
- Base station isolator
- Circulator
- Lithium polymer battery

## Digital Home Appliances

2

- Transformer
- Ferrite core
- Power supply inductor
- HDD magnetic head
- NTC thermistor
- Humidity sensor unit
- Neodymium magnet
- Ferrite magnet
- Choke coil for power factor improvement
- Mid voltage type ceramic capacitor
- Multilayer ceramic chip capacitor
- Capacitor array
- Neodymium magnet for VCM
- PTC thermistor
- Power supply choke coil
- Thin-film common mode filter
- Ferrite beads
- Lithium polymer battery

## Automobiles

3

- DC-DC converter for HEV
- Neodymium magnet
- Ferrite magnet
- Piezo actuator
- NTC thermistor
- Oil temperature sensor
- Gear tooth sensor
- High temperature-guaranteed chip capacitor
- Power supply inductor
- Varistor
- MEMS pressure sensor
- CAN-BUS common mode filter
- Anechoic chamber
- Transponder coil
- Current sensor for automotive use
- SMD gas arrestor

## Industrial Equipment/Energy

4

- Ferrite core
- Neodymium magnet
- Aluminum electrolytic capacitor
- Film capacitor
- Power film capacitor
- Arrestor
- Power line EMC filter
- DC-DC power module
- Digitally controlled power supply
- LED lighting power supply
- Bidirectional DC-DC converter
- Front-end power supply
- Intermediate bus converter
- Amorphous silicon film solar cell
- Flip chip bonder



## Profile

## Global Development

<b>Corporate Name</b>	TDK Corporation
<b>Corporate Headquarters</b>	1-13-1, Nihonbashi, Chuo-ku, Tokyo, 103-8272, Japan
<b>Date of Establishment</b>	December 7, 1935
<b>Consolidated Net Sales</b>	¥814.5 billion (FY March 2012)
<b>Number of Employees</b>	Consolidated: 79,175 (March 31, 2012)

Share of Overseas Production

Japan

19.8%

Outside of Japan

80.2%

Share of Overseas Sales

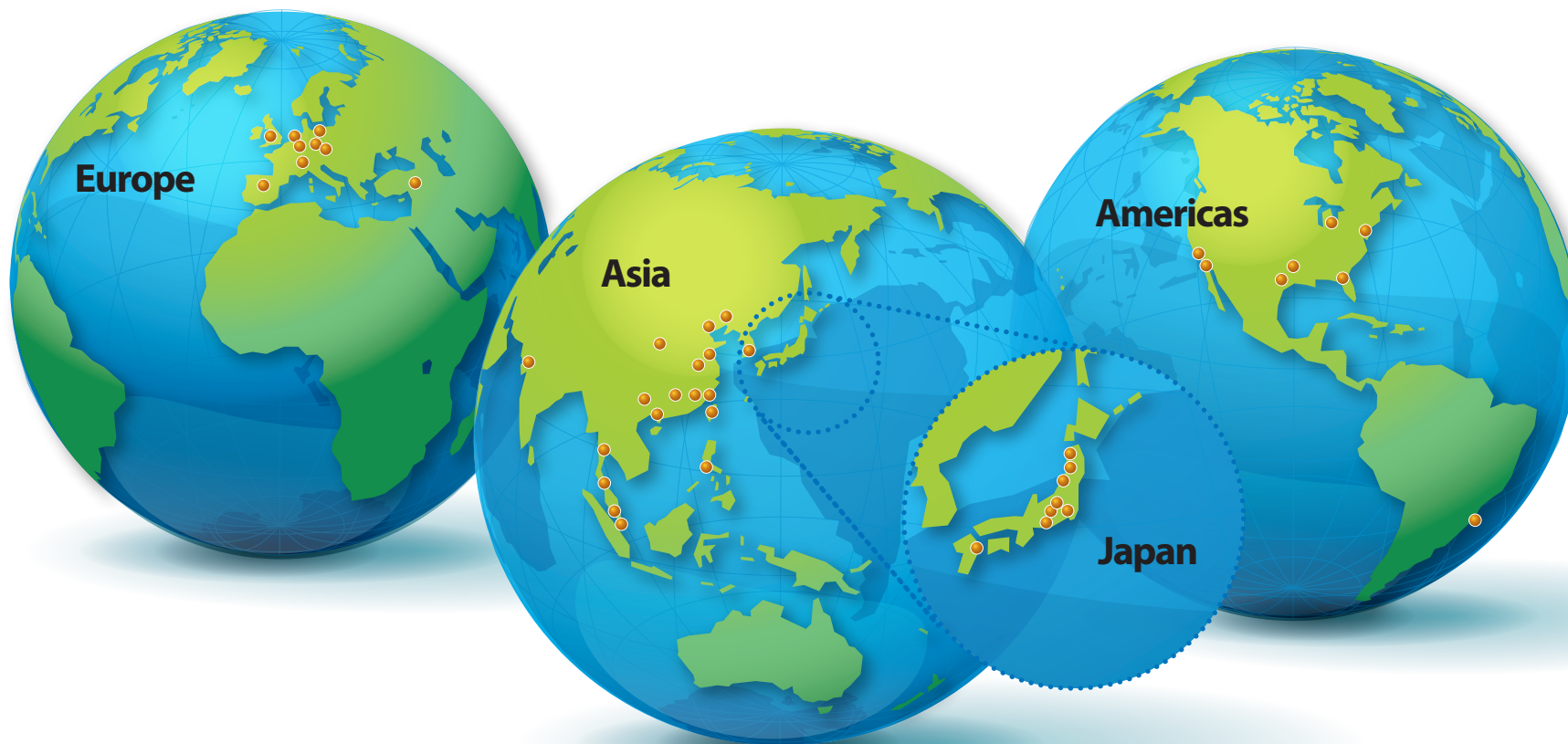
Japan

13.8%

Outside of Japan

86.2%

## TDK Group's Main R&amp;D and Production Centers



## Interview with the President



**We are focusing on growth markets, moving ahead with restructuring, and shifting to a structure that will encourage high earnings.**

### Takehiro Kamigama President and CEO

#### Profile

1981	Joined TDK
2001	General Manager, Recording Device Business Group
2002	Corporate Officer
2003	Senior Vice President
2004	Director, Executive Vice President
2006	Representative Director, President and CEO

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- Q6 What is the state of progress with the company's growth strategy?
- Q7 How is TDK performing in Next-Generation Information and Communications and what is the company's outlook in this category?
- Q8 How is TDK's performance in Energy-related sector such as automobiles and renewable energy?
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## Interview with the President

Q1

**How were business results in the past fiscal year?**

**The past fiscal year marked the start of structural reforms but we were also affected by Japan's earthquake and tsunami and the flooding in Thailand, so both revenue and profits were down.**

The electronics industry as a whole in the past fiscal year (ended March 2012) saw a year-on-year drop in production of hard disk drives (HDDs) as a result of the flooding in Thailand and other adverse factors. However, the market for data communication devices such as smartphones and tablet computers grew steadily. Also, in the auto industry, production of hybrid electric vehicles (HEVs) and electric vehicles (EVs), which feature high environmental performance, grew year on year.

Under these market conditions TDK did well in rechargeable batteries for smartphones and tablet computers, but our sales in magnetic heads for HDDs dropped in step with the fall in production in the HDD market due to the flooding in Thailand. The flooding also damaged our production facilities, and with the drop in sales of suspensions

for HDDs and magnets, sales dropped significantly in our Magnetic Application Products business. Sales were also stagnant in our Passive Components business due in part to a slowdown in the home information appliance industry, which includes flat panel TVs and PCs, as well as production adjustments among some major clients. External factors also had a direct negative impact, including the Great East Japan Earthquake, flooding in Thailand, and the appreciation of the Japanese yen. As a result, our consolidated net sales for the year ended March 2012 were 814,497 million yen (down 6.6% year-on-year), with operating income of 18,687 million yen (down 70.9%), and a current term net loss of 2,454 million yen.

In an effort to shore up our operating base we have already begun to take measures regarding unprofitable businesses, sell off idle properties, and optimize our business locations and personnel system. Also, to boost profits we are aggressively implementing a business structure reform plan. Estimated costs for restructuring will be 13,000 million yen this year and 5,000 million yen next year—a total of 18,000 million yen. We are expecting the improvement effects of 16,900 million yen this year and 16,500 million yen next year—a total of 33,400 million yen.

Q2

**How specifically was TDK affected by the Great East Japan Earthquake and the flooding in Thailand?**

**The electronics industry and HDD industry as a whole saw drops in production, which had a significant negative impact.**

First of all, I would like to express my deepest sympathy to those who suffered in the Great East Japan Earthquake and flooding in Thailand. I pray for the repose of the souls lost in those tragedies.

Although there was little immediate damage to our business from the earthquake, aftershocks and the uncertainty of electric power supply ended up affecting operations at our plants in the region. Some of our operations took measures quickly to minimize damage, while others were late in taking action.

Overall, the experience provided a good lesson in business continuity planning, which was put into effect later in the year with the flooding in Thailand. In any case, these major natural disasters, combined with the slowdown of the global economy, caused downturns in

the electronics market and HDD industry overall, which had a major impact on TDK's business results.

Q3

**What effect has consolidation in the HDD industry had?**

**We see industry consolidation as a move in a positive direction, rather than a negative one.**

HDD industry will be consolidated to three HDD manufacturers, but we see the market for HDD heads that TDK is involved in moving in a positive direction. Quality is the greatest strength of our HDD head business, and our high yield is highly regarded by HDD manufacturers. As data volumes continue to rise, there is a growing demand for HDDs of data centers, which use 4 to 5 platters (disks) as opposed to 1 to 2 in HDD for a home computer. Overall, the number of heads used per HDD is rising. The greater this number the greater the need for higher performance, high-quality heads that have a low rate of failure and don't easily break down. This is where TDK's proven quality and yield offer such high value.

Also, with higher HDD recording

## Interview with the President

density the amount of data that can be stored on each server will increase, making it possible for data centers to keep power consumption under control as their capacity rises. In recent years data centers have been expanding worldwide and their ballooning power consumption and CO<sub>2</sub> emissions have become a societal problem. So, we feel that to further boost HDD recording density is an important societal mission for HDD manufacturers and for TDK, which produces components used in HDDs. To significantly increase recording density, we are developing magnetic heads using thermal assist magnetic recording technology. Today's top storage capacity is around 500 GB per 2.5-inch HDD platter, but using this new technology we aim to double that



capacity to 1 TB. TDK will continue to contribute to the increase of HDD storage capacity by taking advantage of thermal assist magnetic recording technology for the future.

TDK distinguishes itself from its competitors through quality and advanced performance, and we constantly seek to firm up our position as the only magnetic head manufacturer that offers external sales in the industry.

Q4

**How are structural reforms progressing?**

**We are pressing ahead with streamlining efforts at our business locations both in Japan and overseas, and building a production system that is capable of responding rapidly to fluctuating market demand.**

We are currently putting a great deal of effort into streamlining operations at our domestic business locations, which I consider a top priority. We are focusing urgently on restructuring in the category of capacitors in particular, where business performance has been down since the

Lehman Brothers' collapse in 2008, the influx of overseas enterprises in the market, the inflated yen, and falling prices.

We have already announced the plan to consolidate 7 locations among 19 locations in the Tohoku district, which involves not merely consolidating plants but converting them into cutting-edge factories that can handle integrated production from materials to final product processes. We are adding further automation to production lines to improve productivity and boost competitiveness. At the same time we strive to minimize CO<sub>2</sub> emissions in manufacturing as part of our goal of achieving carbon neutrality (see Q&A 10 for more details). These are fundamental reforms to our manufacturing processes. The aim is to shorten lead times, reduce inventory, and slash energy consumption in production, thereby creating a production system capable of responding quickly to the changing demands of the marketplace.

Also, on April 1, 2012 we completed the sale of our display business, which had been a non-core business area. We will continue to reevaluate unprofitable businesses and narrow down the product areas we handle, while concentrating our management resources on highly specialized product areas such as devices for communications, automobiles, and industrial equipment that take best

advantage of TDK's cumulative expertise and technological strengths. At the same time, we aim to optimize our human resources and personnel from a global standpoint at our group locations both in Japan and around the world.

Q5

**Please tell us your goals and product strategy for the new Applied Film Products segment.**

**We are focusing resources on functional films that include areas of expected growth such as rechargeable batteries and films for touch panels.**

Previously, recording media was classified into the Magnetic Application Products segment, but some recording media product lines were terminated, and with the acquisition of production capabilities in battery separators, the main products in recording media have shifted to functional film products; hence we changed the name to Applied Film Products. We have also moved energy devices (rechargeable batteries) into this segment from "Other" because they share similar core technologies and markets.



## Interview with the President

In the fiscal year ended March 2012, sales of rechargeable batteries grew steadily and further growth is expected in the coming year. To improve our production system for applied films, we have set closely integrated connectivity between our functional film mother plant, the Mikumagawa Plant in Oita Prefecture, with Nitto Denko (Shanghai) Electro-Energy Co., Ltd., acquired in November 2011. This move will boost our overall strength in Applied Film Products. We also plan to expand sales of products such as films for electrostatic and resistive type touch panels, and hard coat films.

Q6

**What is the state of progress with the company's growth strategy?**

**We have refined our four growth sectors into two categories with the aim of developing new markets.**

TDK has been focusing on four growth sectors—Communications, Home Information Appliances, Automobiles, and Industrial Equipment and Energy. We are now grouping these sectors into two categories in order to improve

our response to changes in the market environment and to technological advances, which will strengthen our overall business operations.

One category is Next-Generation Information and Communications, where market growth is strong, with a focus on cloud computing. We continue to develop electronic components that meet market demands for smaller, lighter devices that use less power, high-frequency, multi-band modules, etc., for smartphones and tablet devices. Also we plan to expand sales of HDD heads and power supply-related products to data centers.

The other category is Energy-related. To improve the generating efficiency of solar power and wind power facilities, which are needed to bring about smart grids, many kinds of electronic



components are needed that offer low loss and higher energy density. Also, to improve the performance of hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and electric vehicles (EVs), two key issues are boosting the energy product of the magnets used in drive motors and improving the efficiency of the power supply. We supply products for these energy-related markets using TDK's proprietary materials and magnetic technologies.

Q7

**How is TDK performing in Next-Generation Information and Communications and what is the company's outlook in this category?**

**We supply products and offer solutions that enable final products to be made smarter, smaller, and lighter. We anticipate further growth next year and moving forward.**

The demand for data centers is only going to grow as cloud computing and other communications services become more ubiquitous. HDDs are the main type of

hardware used for data storage because of their availability in large capacities and low cost per unit of storage capacity. Demand for HDD heads in the year ended March 2012 dropped temporarily due to the effects of the flooding in Thailand, but began to recover in the fourth quarter. The sector was buttressed by strong demand in the market related to data centers, and growth can be expected in the fiscal year ending March 2013.

In the market for smartphones and tablet devices we are currently implementing sales expansion tactics to major device manufacturers. To this point, the Group has had business dealings with a large number of major device manufacturers in the area of noise countermeasure components and other inductive devices, but not enough customer development in high-frequency components. In the last fiscal year we actively promoted TDK's extensive product lines and modularization capabilities to device manufacturers that hold significant market share. We are confident that such efforts will bring us a wider range of clients for a variety of TDK products in the fiscal year ending March 2013.

Recent multifunctional smartphones employ over 300 types of electronic components. TDK supplies high-quality, high-performance components and modularization solutions, enabling the



## Interview with the President

final product to function with more advanced capabilities with a lighter, thinner form factor.

Q8

**How is TDK's performance in Energy-related sector such as automobiles and renewable energy?**

**We are currently expanding sales of many types of power electronics products and working to develop rare-earth-free next-generation high-performance magnets.**

With rising fuel prices, there have been strong sales in fuel-efficient eco cars—HEVs, PHEVs, and EVs. Improvements are also being made to standard internal combustion engines to boost fuel economy through vehicle weight reductions and increasingly sophisticated electronic engine control.

As the electronic systems in automobiles become more technologically advanced, the demand will grow for TDK's power electronics products such as DC-DC converters and high-power film capacitors. Also, TDK's smaller, lighter ferrite magnets

are in high demand for their contribution to making cars lighter.

The electric drive motor and generator in HEVs, PHEVs, and EVs use neodymium magnets and other high-performance magnets. The rare earth elements neodymium and dysprosium are used in the production of neodymium magnets. In recent years the rising price of these rare earth metals and their supply instability have become major risk factors.

As a pioneer in magnetic materials, TDK has been working on developing production technologies for new neodymium magnets that use a reduced amount of rare earth metals. We have already developed a new method that halves the use of dysprosium, for which a mass production system will be established within this fiscal year. We are also currently working to develop technologies that completely eliminate the use of dysprosium. Finally, we are working to develop methods for creating magnets that are entirely free of rare earth metals.

In the fields of renewable energy and smart grids as well, we expect a rise in demand for power electronics products from TDK. Our neodymium magnets are used in wind power generation, and we supply a industry's broadest range of passive components for power conditioners used in power generation and distribution facilities.

Additionally, high-voltage direct current (HVDC) systems are gaining attention worldwide for low power loss in the transmission of electricity, and such systems have started being adopted in many areas. TDK has a particular strength in HVDC film capacitors, and we aim to expand sales of related products as the use of HVDC spreads in the future.

Q9

**Could you tell us about upcoming R&D efforts and your stance on M&A?**

**We are devoting resources to R&D on material technologies and process technologies and are also reviewing M&A actions as a method for accelerating growth.**

Material technologies are like TDK's corporate DNA. TDK concentrates especially on R&D in magnetic materials. We have positioned 2012 as the first year of a new era in magnets because for the first time we will commercialize magnets that use only half the amount of dysprosium, as I stated earlier. We are also pushing to develop rare-earth-free magnets as a final goal. Reducing the use

of expensive rare earth metals will lower costs, naturally, but it is also an important issue for reducing environmental impact. So, success in developing rare-earth-free magnets is also a way to fulfill our social responsibility.

We have already succeeded in developing ferrite magnets that contain no lanthanum or cobalt and are now working to expand sales of these new magnets.

Process technology is another core area that keeps TDK competitive by enabling us to take advantage of the properties of materials to manufacture high-quality products at low cost. Two such key technologies are: thin-layer and high-precision processing that TDK has developed through the production of HDD heads; and film manufacturing processes, developed through the production of magnetic tape.

We are applying thin-layer and high-precision processing to electronic components such as capacitors and high-frequency components in order to develop and mass produce smaller, higher performance components. We use film manufacturing processes at the Mikumagawa Plant, our mother plant for manufacturing functional film products of all kinds. And we will continue to develop cutting-edge production technologies with an eye toward applying film manufacturing processes to electronic

## Interview with the President

components and rechargeable battery separators in the future.

With regard to mergers and acquisitions, to strengthen TDK's core technologies and enhance our capabilities in our two growth areas, we will continue to study the cooperation with companies or M&A of companies that hold unique technologies and products by watching business deployment and technology trend.

Q10

#### What is TDK's approach to corporate social responsibility?

**We strive to maintain the trust of our stakeholders at all times and are working especially to achieve carbon neutrality and train personnel on a global scale.**

TDK's management philosophy is to contribute to culture and industry through creativity. The basis for our CSR activities is to put this philosophy into practice on a daily basis, from our top executives down to each and every employee in the group worldwide. When every person employed by TDK is trustworthy, the company as a whole wins

the trust of all of our stakeholders.

Two important aspects of being trustworthy are taking measures to protect the environment in all that we do, and maintaining good relations with local communities and a good standing in the global community. Specific actions we are taking start with the goal we have set to achieve carbon neutrality. TDK is the first company in Japan's electronics industry to set this goal. Carbon neutrality means reducing emissions of greenhouse gases in all of our business activities to zero or less. This is accomplished by subtracting the amount of emissions reduced or absorbed in another location, for example, due to the use of TDK products that reduce greenhouse gases from the emissions produced in manufacturing operations. As chairman of the Electronic Components Board (ECB) of the Japan Electronics and Information Technology Industries Association (JEITA), I will personally be trying to expand such efforts throughout industry and get Japan's carbon neutrality certification system accepted as an international standard.

TDK is a global company with over 80% of its sales coming from global markets. So, another important responsibility is to actively train and promote people in locations worldwide. TDK places special emphasis on training in the manufacturing sector, one of our

greatest strengths. To pass on our long-established manufacturing know-how to the next generation we have set up the TDK Monozukuri Tradition Seminars. The aim of these seminars is to help management candidates develop the thinking skills needed for management positions in order to produce high-quality products efficiently and with low environmental impact.

Also, with the cooperation of the mayor and related government personnel in Dongguan, China, TDK aims to discuss what kind of CSR activities are needed by local communities in that area and to carry out those activities.

Q11

#### What is TDK's outlook for fiscal 2013?

**We expect increased revenues and a rise in earnings as our structural reforms bear fruit and demand increases in growth markets.**

We will continue to strongly push structural reforms in the fiscal year ending March 2013. Our first goal is to establish a revenue base capable of bringing about



stable profits in the passive components business. Also we anticipate healthy development in the communications market, which includes smartphones, as well as in cloud computing which relies on data centers, and the automobile and energy-related markets. We also anticipate increased year-on-year sales in recording devices, which includes HDD heads, as well as in passive components and rechargeable batteries. Our consolidated performance estimates for the year ending March 2013 are 900,000 million yen in sales, 57,000 million yen in operating income, and in net profit 40,000 million yen.

**Special  
Feature**

# Promoting Global Change for the Better: TDK

Smartphones and cloud computing are just two examples of technological advances that make daily life richer and more rewarding. But on the other hand, the world faces serious challenges that concern all of humanity, such as global warming and the depletion of energy sources. The world we live in changes day by day, often at breathtaking speed. TDK is heavily engaged in developing technologies aimed not only at making life more enjoyable but also at helping to overcome obstacles and finding new solutions. Making these widely available on a global basis is our contribution to the society of the future.

## CLOUD COMPUTING

## SMART CITY



## Special Feature Promoting Global Change for the Better: TDK

# Smartphones and the cloud computing dynamically drive the globalization of society forward

Using software and systems via an Internet connection is the basis of cloud computing. A variety of network services allow users of mobile phones, tablet devices, and similar devices to do email, browse websites, participate in social networking sites, and do a myriad of other things wherever and whenever they wish. Only a concept not too long ago, it has already become a reality. The spread of multi-function mobile terminals such as smartphones drives the rapid evolution of network services, which have become ever more sophisticated and capable of handling enormous amounts of data. In order to fully realize a rich and varied network society, TDK provides the technology and products that advance the progress of mobile devices and data centers.



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**Making Smartphones More Capable and More Compact**  
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# 2

**Enabling Data Centers to Handle More Data While Consuming Less Energy**  
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# A new “energy aware” society making use of renewable energy sources and eco cars is emerging in various places around the world

In view of global warming and increasingly severe energy related problems such as the depletion of energy sources and the high price of oil, the use of renewable energy, in particular solar and wind power, is gaining traction on a global scale. In the automobile sector, companies are working to make gasoline-powered cars more fuel efficient, and the development of next-generation automobiles including hybrid and electric vehicles is progressing at a rapid pace. TDK contributes not only to the advancement of energy-saving technology; we are also involved in the “Smart City” concept that is being developed in various locations around the globe. This is our way of helping to realize a sustainable society.



# 3

**Helping to Reduce the Environmental Impact of Cars and Promoting Increased Use of IT**  
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## Special Feature Promoting Global Change for the Better: TDK

1

### Making Smartphones More Capable and More Compact

#### The arrival of the "cloud society" empowers mobile terminals

The spread of cloud computing has made it possible for users not only to do mail or browse the web on the road, but also has opened up a wide variety of other applications. It is now possible to watch videos, access a vast music library, participate in social networking, play games, look in dictionaries, get the latest weather forecasts, use positioning search, and do a host of other things wherever and whenever one wants. Advanced mobile devices allowing users to enjoy such services and content at high speed and with high image quality are rapidly gaining a large market share. The smartphone

is increasingly taking over from the mobile phone of the past and has already surpassed personal computers in terms of sales figures. At the same time, functions and specifications are progressing by leaps and bounds. A sleek modern smartphone that can be held in the palm of one's hand is in fact nothing less than a mobile computer, offering capabilities and specifications that rival a high-performance PC.

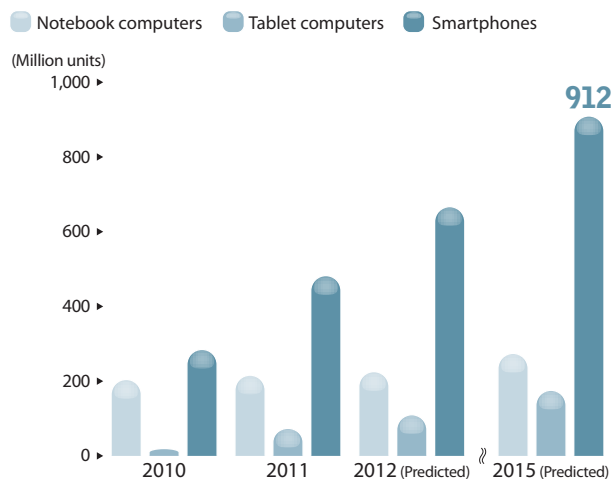
#### Devising total solutions for condensing a multitude of functions within a limited space

Accessing a wide range of network services at high speed, enjoying high-definition video, going beyond voice and mail

communication to take high-resolution pictures and watch TV... These are just some of the things that smartphones are expected to allow these days, while the devices at the same time are becoming even smaller and more lightweight. In order to make this possible, an enormous number of tightly packed electronic components of many types and shapes are working inside the device.

And this is where TDK with its world-leading technology for ultra-compact, high-performance electronic components comes in. The range of our products, centered around passive components, is wide and varied. Coils for power circuits, multilayer ceramic chip capacitors, all

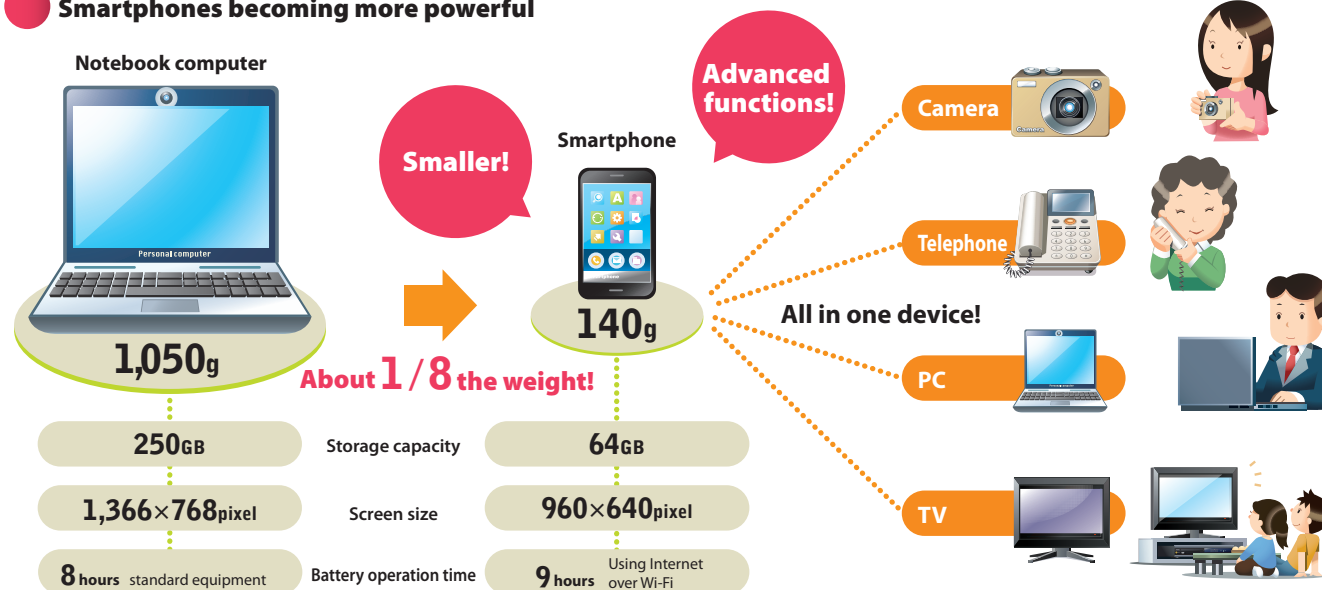
#### Rapidly growing global smartphone market



Source: Data prepared by TDK, based on "Worldwide Electronics Market 2012 - Comprehensive Study" by Fuji Chimera Research Institute, Inc.

TDK Corporation Annual Report 2012

#### Smartphones becoming more powerful



Data compiled by TDK



## Special Feature Promoting Global Change for the Better: TDK



kinds of inductors, noise countermeasure filters, RF components essential for multi-band operation and supporting different communication standards and frequency ranges in a single product, ITO transparent conductive film for touch panels, the list goes on. TDK offers total solutions in the device sector that allow smartphones to become more capable, smaller, thinner, and weigh less.

TDK harnesses advanced and innovative techniques such as thin film technology, micro wiring technology, and modular technology for integrating multiple devices (see sidebar), to drive progress and propel electronic components towards even higher density.

### Not only "lighter, thinner, shorter" but also less power

Mobile communication terminals such as smartphones not only need to deliver higher performance and incorporate more functions, they are also being increasingly used for extensive periods and under heavy load such as when playing games or taking photographs. This means that battery life is a crucial factor. TDK pursues a comprehensive approach in this regard, through measures such as reducing the power consumption of various components and increasing the efficiency of power supply devices. A case in point is the multilayer power inductor MLP1608-V series which utilizes low-loss ferrite as

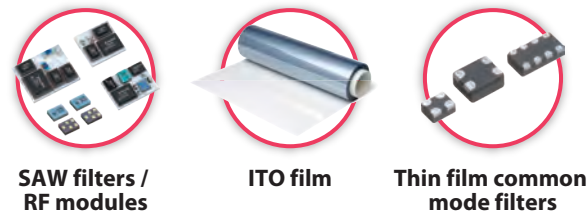
magnet material to provide the same power conversion efficiency as existing products at less than one half the volume. The product has attracted considerable attention as a way towards realizing more compact dimensions while at the same time reducing power consumption. We also are working on promising solutions in the field of rechargeable batteries for mobile devices, by developing lithium polymer types with higher capacities. The TDK Group will use its comprehensive technological prowess also in future to advance the progress of smartphones and empower even more enjoyable mobile computing.

### TDK product palette for advanced smartphones

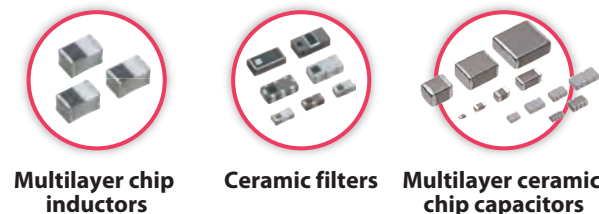
#### Lower power consumption



#### Advanced functions



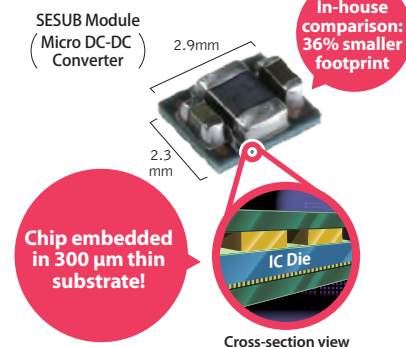
#### Smaller, thinner, lighter



### TDK Module Technology

#### Ultra-miniaturized module with embedded chip in 300 μm substrate

In order to realize the miniaturization of electronic devices, TDK has been working at the cutting edge of module techniques for integrating multiple electronic components in a single entity. A major breakthrough in this area is our SESUB (Semiconductor Embedded in SUBstrate) technology which allows embedding chips and other components as well as the wiring in the substrate, resulting in an extremely low profile of essentially only the substrate thickness. Rather than placing IC chips on top of a circuit board, the innovative TDK approach takes them right into the substrate itself. This is of course not an easy task, requiring advanced technological know-how in areas such as chip processing and micro wiring. As a result, TDK successfully has developed power supply modules for smartphones with a mounting footprint of less than half that of conventional types.



## Special Feature Promoting Global Change for the Better: TDK

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## Enabling Data Centers to Handle More Data While Consuming Less Energy

### Explosive growth of data volumes handled on the Internet causes rapid expansion of data center market

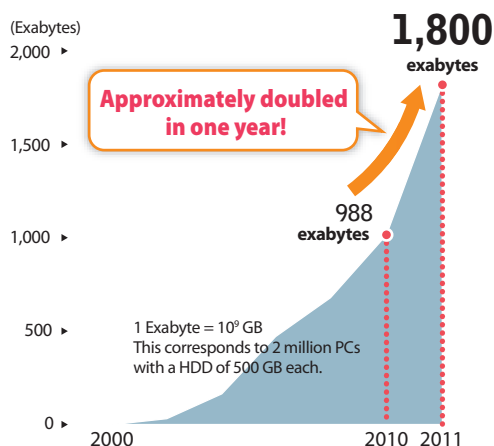
The spread of cloud computing and smartphones is accompanied by a trend towards higher-volume content. Data that are being moved on the Internet are increasingly evolving from documents, images, and audio towards high-resolution video, games, and similar data-intensive digital content. This has led to an explosion in data volumes handled on the Internet. In fact, the amount of information has jumped by a factor of 10 over the past five years. Storing such massive amounts of data requires a multitude of servers which in turn

require a lot of space as well as a high-performance communication environment with high-level security features. The costs involved are substantial. However, in the prolonged severe economic climate that exists today, businesses are acutely aware of their IT costs and increasingly rely on data centers that have dedicated facilities for operating and managing servers. Especially in Japan, the Great East Japan Earthquake was a wakeup call that has resulted in a drastic jump in demand for data centers to be used as part of business continuity planning (BCP) in the event of natural disasters, resulting in a larger data center market.

### Working towards even higher recording densities to reduce power consumption by data centers

When having to process large volumes of data at high speed, server power consumption as well as released heat increases significantly. Air conditioning facilities are required to cool the servers, and their power consumption also becomes a major factor. Including UPS (Uninterruptible Power Supply) facilities to ensure round-the-clock operation every day of the year, the overall power consumed by data centers is enormous. As our modern world becomes more and more oriented towards power saving, finding ways to cut down on data

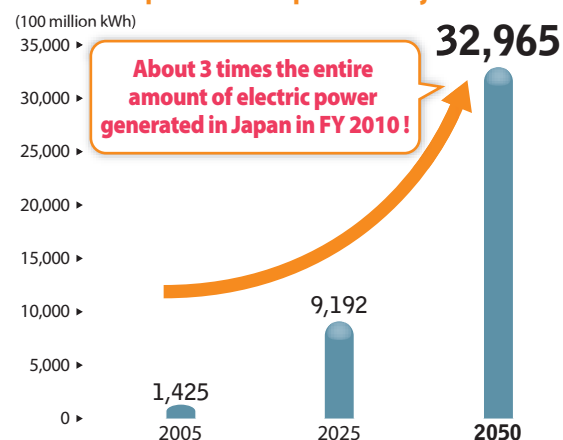
### Explosive growth in amount of information generated worldwide



Source: Compiled by TDK, based on Horizon Information Strategies, cited from "Storage: New Game New Rules" and Information Data Corporation, "The Diverse and Exploding Digital Universe," 2008.

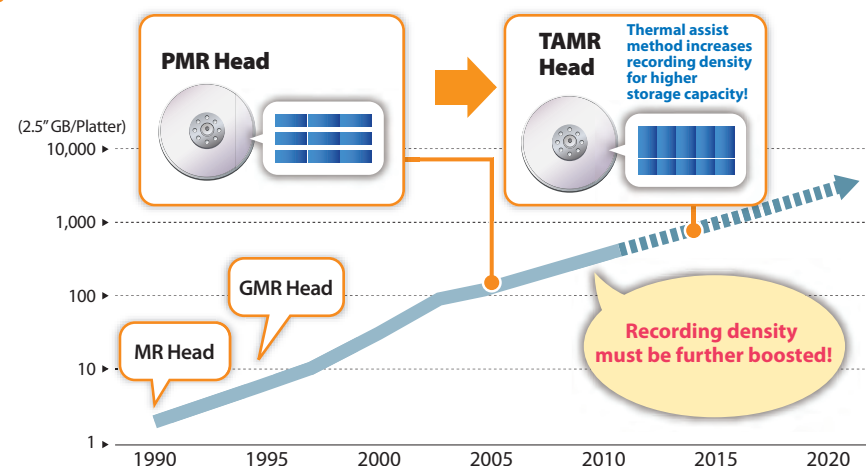
### Predicted energy consumption by data centers worldwide

Reduction of power consumption is a major social issue! >>> To reduce power consumption and increase information handling capacity...



Source: Compiled by TDK, based on the "GIPC Survey and Estimation Committee Report FY 2008"

### Development targets for HDDs



## Special Feature Promoting Global Change for the Better: TDK

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### Data Centers

center power use is a crucial challenge. The key here is further increased recording density. For TDK as a worldwide leader in the sector of magnet heads for HDDs, tackling this problem therefore is an issue that tests our commitment to contribute to the betterment of society. In the past, we successfully led the way towards smaller HDDs with higher capacities, through a series of major technological breakthroughs. This includes the application of thin film process technology to create thin film magnetic heads for high-density recording, and the move from longitudinal magnetic recording to perpendicular magnetic recording (PMR) where data are arranged in

a pattern that is perpendicular to the platter surface. We are now working to elevate recording density to the next level through various means, including the practical application of another innovation called "Thermal Assist Method" (see sidebar).

### Wide range of storage solutions support the advance of data centers

Going beyond magnetic heads for HDDs, TDK is also involved in other means of data storage, with products for solid-state drives (SSD), LTO tapes, and multilayer optical discs. In all of these areas, we offer total solutions geared towards higher recording density by maximizing the potential of the

respective media.

On the other hand, we also provide the technology and comprehensive solutions for data centers to reduce their energy consumption. For example, TDK offers highly efficient power supply modules for blade servers, a field where demand is rising. We also produce compressor magnets that contribute to more efficient operation of air-conditioning systems, power supply modules for UPS systems, and various other products and technologies that can help data centers save power.

## TDK Group Solutions

### Support for higher speeds and larger capacity



HDD

#### HDD head/suspension

Achieved world's highest recording density.

#### VCM (voice coil motor) magnet

New magnet for head drive motor significantly reduces dysprosium consumption.

#### Optical communication cable

Changing data center internal wiring to optical fiber.

#### LTO tape

Highly reliable recording media for archiving purposes, with further enhanced recording density

### Contribute to energy savings

#### Front-end power supply

Improve power usage efficiency.

#### Bidirectional DC-DC converter

Low-loss power conversion allows efficient use of power from backup battery.

#### Compressor magnet

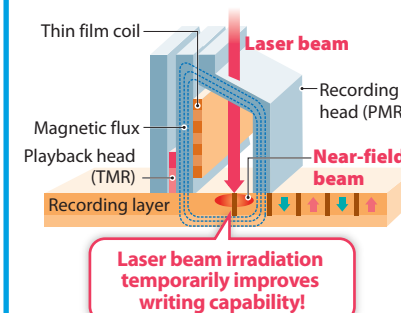
More efficient air conditioning systems



## TDK HDD Head Technology

Thermal assist technology will further boost HDD recording capacity

One approach to increasing the recording density of a HDD is to make the recorded bits on the magnetic media smaller. However, this also means that the coercive force of a recorded bit decreases. We have countered this tendency by changing the recording media to a material that has higher coercivity to start with. But when coercivity is high, the recording head may have trouble writing the digital information. The breakthrough technology that is expected to transcend this limitation is called thermal assist recording. It consists in irradiating the recording media surface with a laser to heat it up, thereby temporarily reducing the coercive force and facilitating the recording process. After cooling down, even small bits can maintain sufficient coercive force, which allows increasing the recording density.



## Special Feature Promoting Global Change for the Better: TDK

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## Helping to Reduce the Environmental Impact of Cars and Promoting Increased Use of IT

### Rising price of oil and increased environmental awareness make fuel economy a top priority

In order to counteract global warming, reducing emissions of CO<sub>2</sub> and other greenhouse gases has become a global goal. Environmental regulations for automobiles have become more severe, and strict standards for fuel economy are expected to be applied around the world in the coming years. In addition, the price of oil continues to climb, making the question of how to improve the fuel economy of vehicles a matter of survival in the industry. With regard to gasoline-powered cars, the approach to improving fuel economy is divided into two major areas, namely a thorough reduction of the entire weight of

the vehicle, and improving the combustion efficiency of the engine.

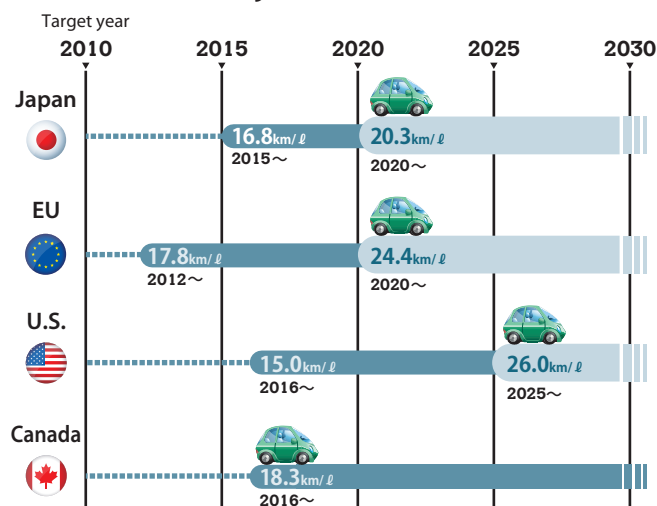
By making its electronic components smaller and lighter, and by enhancing the electronic control of combustion efficiency, TDK is making significant contributions in both of these areas.

### A wide range of products for enhancing fuel economy of gasoline cars, and fuel economy as well as charging efficiency/range in eco cars

Modern cars incorporate a great number of compact electric motors, for raising and lowering the windows, adjusting the rear view mirrors, and many other tasks. TDK has developed a new manufacturing technique that allows making the ferrite magnets used

in such motors significantly thinner. The total magnet weight is 60 percent less, and the overall size of the motor has shrunk by some 30 percent, bringing clear benefits from the point of view of vehicle body weight reduction. Piezoelectric actuators used to control fuel injection valves, pressure sensors, temperature sensors, and various other devices supplied by TDK help to boost combustion efficiency. Improving the fuel economy of gasoline-fueled engines is an important step, but TDK also offers an impressive array of electronic components for electric vehicles (EV) and hybrid electric vehicles (HEV) which are expected to become much more widely accepted in future.

### Environmental regulations (fuel economy standards) in major areas



Source: Data compiled by TDK, based on "Reality and Future Prospect of Electric Vehicle Market 2012" by Fuji-Keizai Group

### TDK Group Solutions

#### DC-DC converter for HEV

Industry-leading compact size, light weight, and high efficiency contribute to better fuel economy of hybrid electric vehicles in Japan and overseas.

#### Compact motor ferrite magnets

High coercivity and thin profile contribute to size and weight reduction in motors.

#### Metal magnets

Used for main drive motors and power generators, these magnets enable high-efficiency drive.

#### Multilayer ceramic chip capacitors

Contribute to smaller size and lower profile of many electrical parts.



### Better fuel efficiency



#### Current sensor

Allows accurate monitoring of automotive battery condition, for lower power consumption.

#### Film capacitors

Used in power supplies and other equipment for automotive applications.

#### NTC thermistor for temperature sensing

Outstanding heat resistance and oil resistance have resulted in a large market share.

#### Common mode filter for automotive LAN

Noise control components for automotive LAN realize high reliability through resistance against heat, vibrations, and impact.





## Special Feature Promoting Global Change for the Better: TDK

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Eco Cars

The TDK lineup includes powerful metal magnets (see sidebar) for the drive motors of such vehicles, DC-DC converters that change the high voltage of the main battery into the low voltage required by the electric and electronic equipment of the car, current sensors that monitor the battery condition, and many other devices that help to make eco cars more sophisticated, reduce fuel consumption, and improve charging efficiency/range.

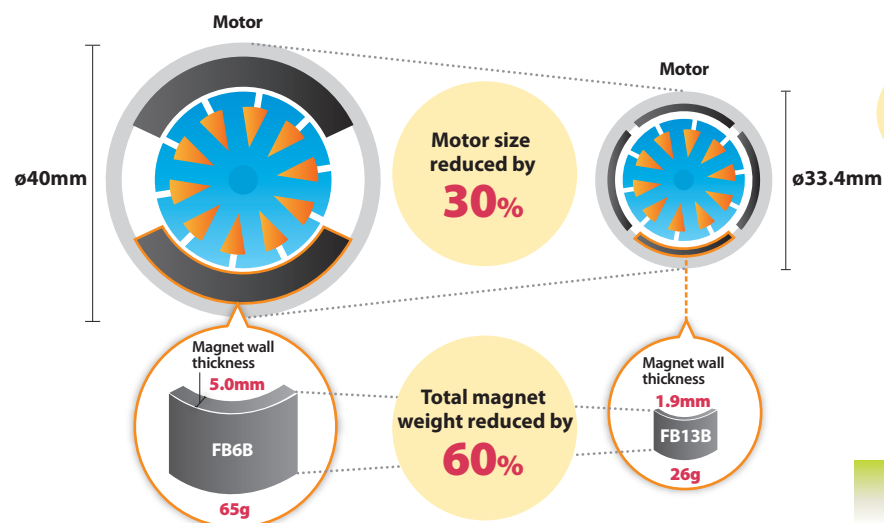
### Communication technology and technology for various types of sensors also contributes to IT implementation in automobiles

To improve not only fuel economy and performance but also driving safety and

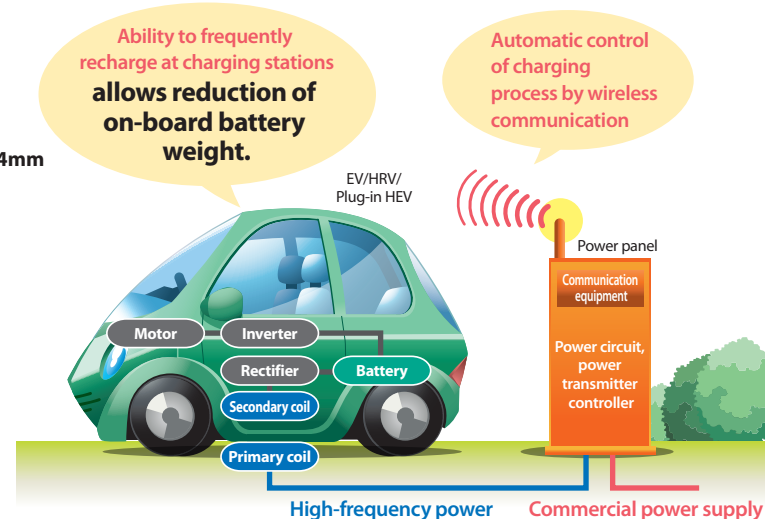
convenience, cars make increasing use of electronics and IT. The share of electronic components in the total cost of the vehicle is about 30 percent for combustion engine cars, 50 percent for hybrid electric vehicles, and as much as 70 percent for electric vehicles. On the other hand, the progress of cloud computing and wireless communication technologies has enabled the spread of telematics, referring to the use of the Internet and various other communication based services such as for broadcast and information reception, electronic transactions, etc. TDK is offering an array of devices that serve as the building blocks for such systems and that are especially designed to withstand the harsh conditions that exist in an

automobile, including the extremely high temperatures in the engine room. Noise countermeasure filters and related products rated for compatibility with automotive LAN standards serve to improve the reliability of in-vehicle networks. With a view towards the future, TDK is also engaged in research and development aimed at making wireless power transfer systems a practical reality. These will simplify the charging process for electric and plug-in hybrid electric vehicles and facilitate integration with energy networks. We will continue to work towards energy savings and enhanced convenience for automobile users.

## Making electric motors even smaller and lighter



## Wireless power transfer system holds high promise



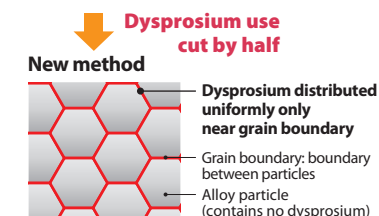
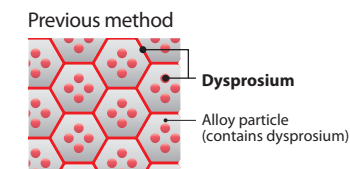
Spotlight

## TDK's motor magnet technology

Working towards developing completely new magnets with dysprosium content cut by half or eliminated completely

Rare earth materials are only found in a small number of countries and supply tends to be unstable. One of TDK's areas of expertise is metal magnets for the drive motors and electric generation motors in electric and hybrid electric vehicles. But as such motors use dysprosium, a rare earth material, procurement risks and the possibility of price rises were a concern.

TDK therefore embarked on the development of a new method that cuts dysprosium use by half. Mass production using the new technique began in March 2012. Going even further, research is currently under way towards eliminating dysprosium altogether.





## Special Feature Promoting Global Change for the Better: TDK

# 4



## Helping to Realize the Smart City

### Increasing use of natural energy and smart grid

Global warming and the rising price of energy are propelling us towards the post-oil era, marked by increasing use of natural renewable energy sources such as wind power and solar power. At the same time, intensive research and development is under way into applying IT to the distribution of electrical power, thereby creating the next-generation power distribution network called the smart grid, designed to optimize operation and handle power more efficiently.

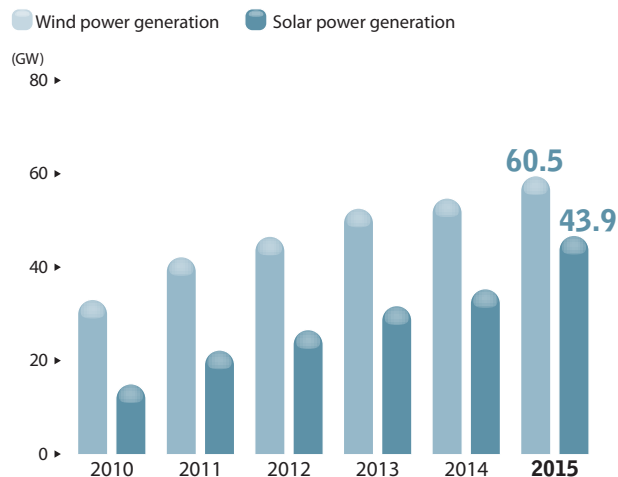
The smart grid will function as a social infrastructure that uses bidirectional

network technology to link a number of diverse areas. These include HEMS (Home Energy Management Systems) geared towards increased use of natural energy in individual homes and built around smart meters that make the grid usage status transparent, eco cars such as EV, HEV, PHEV, and facilities for generating and transmitting power from natural sources. This will optimize the supply and distribution of electrical power for all members of society. The first step currently being realized in various locations around the world are local smart grids based on "locally produced and locally consumed energy."

### TDK products shine in all areas involving electrical power: creation, storage, conversion, transmission, and protection

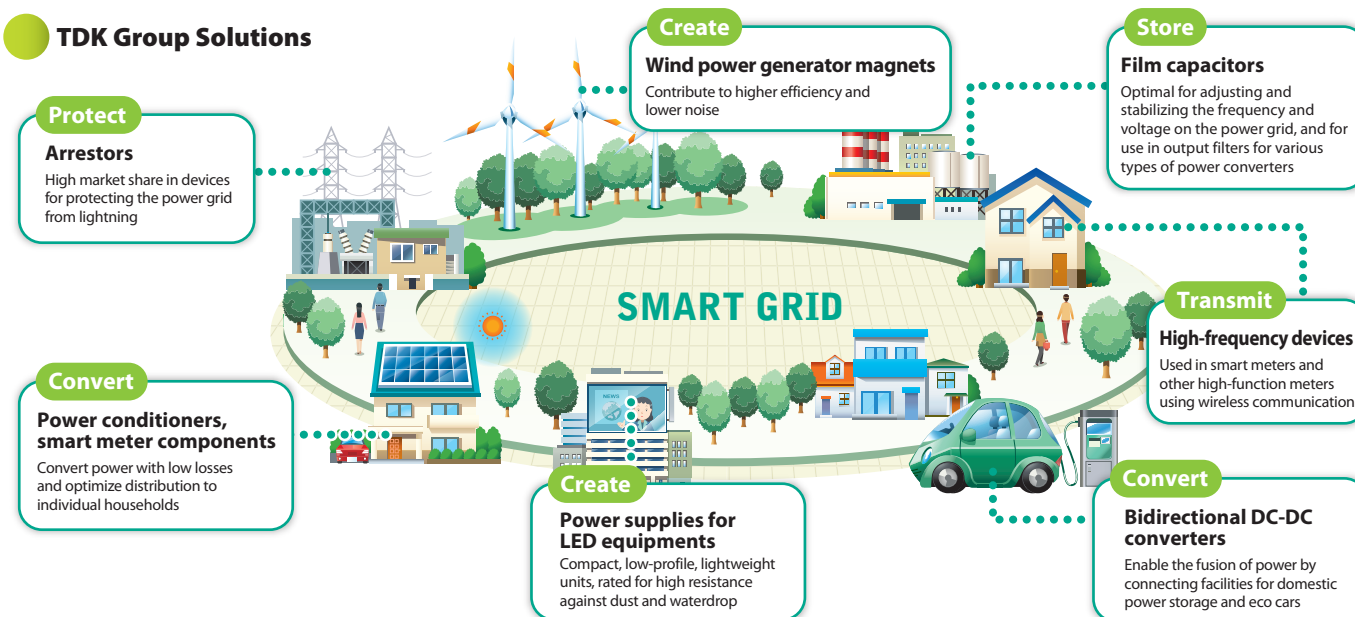
TDK produces core devices for the field of power generation from natural sources. This includes powerful neodymium magnets (NEOREC) used in wind power generators, electronic components for power conditioners that convert the direct current produced by natural energy power generation into alternating current for distribution to homes, and various other products. Power conditioners in particular are indispensable for configuring systems for renewable energy, an area with rapidly

### Increasing use of natural energy sources worldwide



Source: Data compiled by TDK, based on "Global Wind 2010 Report", Global Wind Energy Council, and "Global Market Outlook for Photovoltaics until 2015", EPIA.

### TDK Group Solutions



## Special Feature Promoting Global Change for the Better: TDK

4

Smart City

rising demand. About 30 percent of parts cost are for passive components. TDK's broad lineup of aluminum electrolytic capacitors (see sidebar), transformers, inductors, reactors, and other passive components for power conditioners helps to increase power conversion efficiency. We also provide storage batteries, high-capacitance capacitors, battery management systems, and other devices for the power storage sector. Power electronics products from TDK include bidirectional DC-DC converters for power conversion between the generated DC and AC for feeding unit the grid. We are active in every aspect of the industry, helping to realize

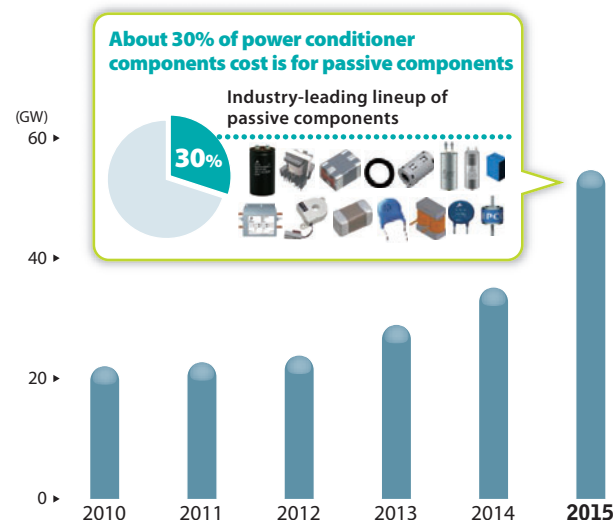
the efficient generation and transmission of electrical power.

### Power capacitors are key devices for high-voltage direct current (HVDC) transmission systems

In recent years, high-voltage direct current (HVDC) systems for power transmission are gaining traction, thanks to their low losses over long distances. For stable operation of HVDC systems, power capacitors that smoothen the voltage are indispensable. Such power capacitors must be designed for high loads and meet extremely strict specification requirements such as a service life of 40 years and more. Only a

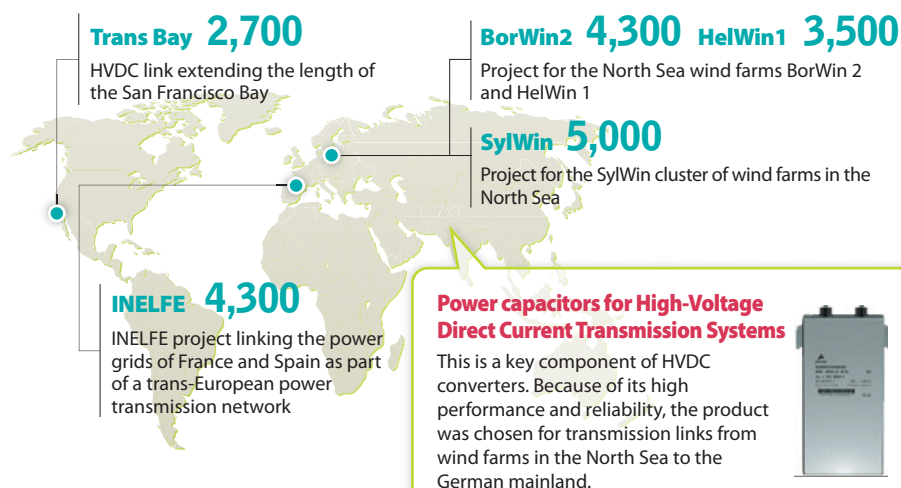
few manufacturers worldwide are able to produce these devices. TDK is an important supplier to leading HVDC systems manufacturers on the global stage. We supply power capacitors for large-scale projects such as the Trans Bay project extending the length of the San Francisco Bay, and a power transmission system linking France and Spain.

## Projected worldwide demand for power conditioners



Source: IHS iSuppli Research, February 2012

## Voltage source converter (VSC) HVDC project



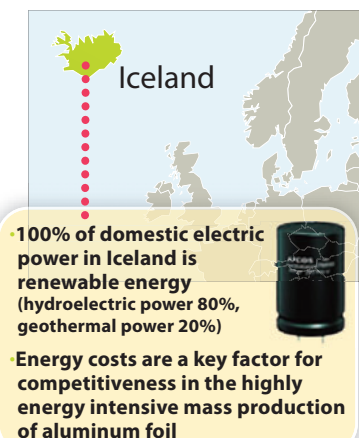
Note: Figures indicate the number of power capacitors (approximate) per project



## Aluminum electrolytic capacitors

Advanced aluminum electrolytic capacitors are vital for renewable energy technologies

TDK is developing and manufacturing aluminum electrolytic capacitors that are key components in green energy technologies such as solar power and wind power generating facilities. The aluminum foil that is a major component of these capacitors is manufactured in a plant in Iceland. We have chosen this location because Iceland derives 100 percent of its domestic electric power from renewable energy sources. Aluminum foil production is very energy-intensive, making the choice of Iceland with its low-cost, clean energy a significant factor in gaining a competitive edge.

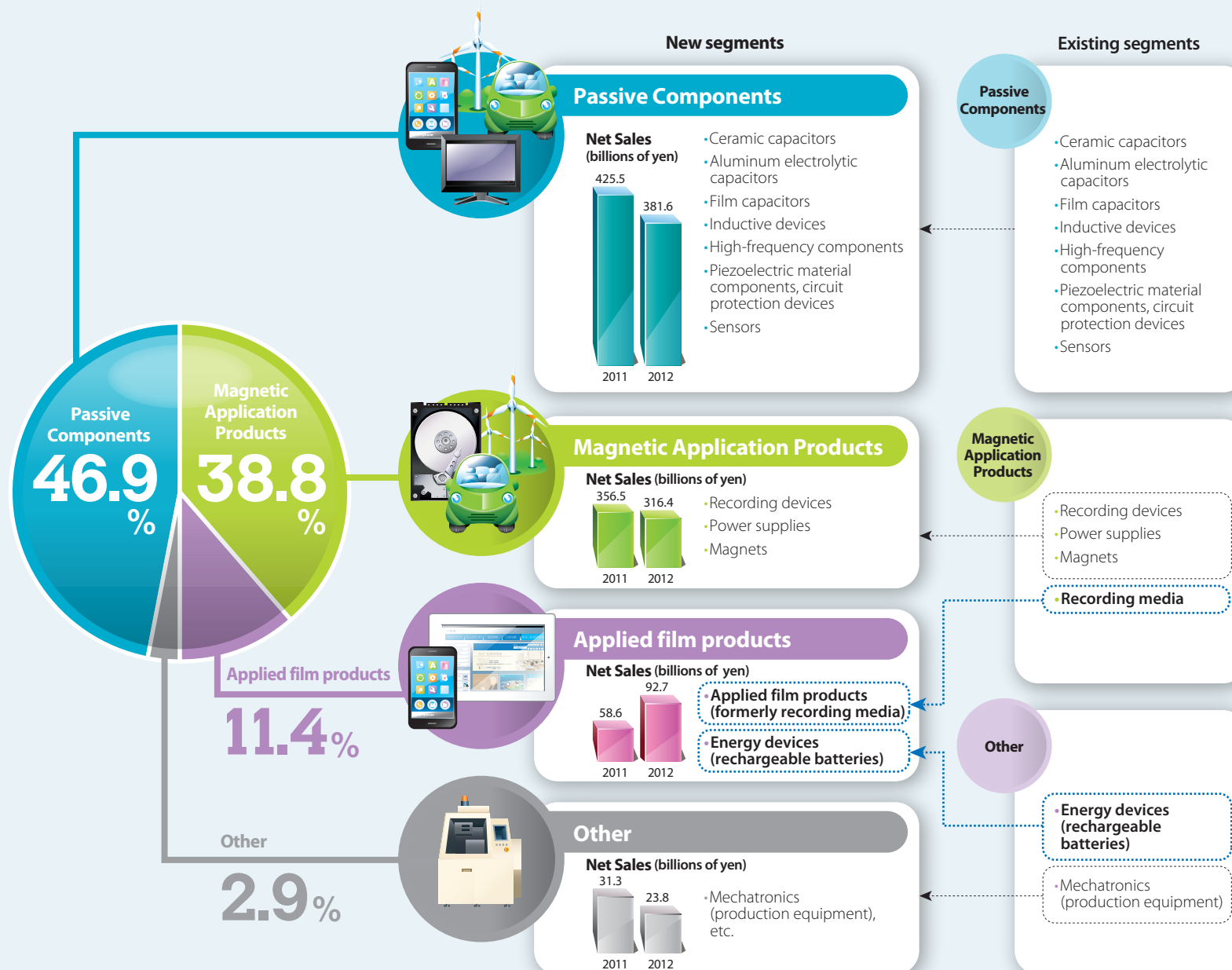


# Sales Results



TDK Group's net sales for the fiscal year ended March 31, 2012 were ¥814,497 million, down 6.6% from the previous fiscal year, and operating income was ¥18,687 million, down 70.9%. Results in electronics markets varied greatly depending on the set (final product). Production of mobile phones, particularly smartphones, and tablet computers was up sharply. Hybrid electric vehicle and electric vehicle production remained strong. In contrast, production of flat-panel televisions and PCs was at low levels, and hard disk drives (HDDs) production fell because of damage from the flooding in Thailand.

In conjunction with the transformation of major recording media products, which previously were categorized as magnetic application products, to functional film products, their designation was changed to applied films. Starting in the current fiscal year, these products are reported on the new applied film products segment along with energy devices, which have similar core technologies and markets.

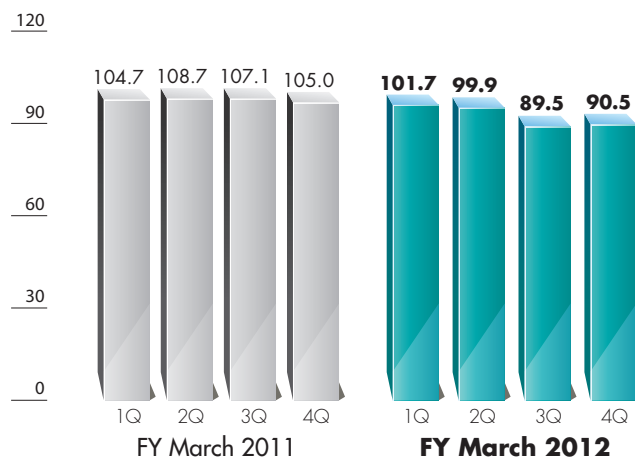


## Sales Results

## Passive Components

This business segment encompasses "Capacitors", "Inductive Devices", and "Other Passive Components". "Capacitors" includes ceramic capacitors, aluminum electrolytic capacitors, and film capacitors. "Other Passive Components" includes high-frequency components and piezoelectric material components, as well as circuit protection devices and sensors.

Sales (billions of yen/quarter)



**Demand in automotive markets increased while the home information appliance market and communications equipment market slumped, and as a result, sales were down 10.3% year-on-year.**

Total net sales in the segment during the fiscal year ended March 31, 2012 were ¥381,576 million, down 10.3% from the previous year, and operating losses were ¥6,610 million, down ¥31,093 million. Results by product segment are set forth below.

## Capacitors

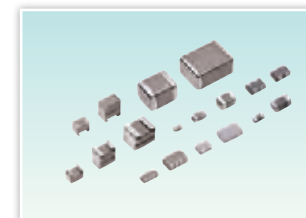
Sales of aluminum electrolytic capacitors and film capacitors to the industrial equipment market and the automobile market were up. Sales of ceramic capacitors to the home information appliance market, however, were down. As a result, net sales were ¥132,364 million, down 9.0% from the previous fiscal year.

## Inductive Devices

Sales to the automotive market increased, but sales to the home information appliance market decreased. As a result, net sales were ¥121,201 million, down 6.9% from the previous fiscal year.

## Other Passive Components

Sales of high-frequency components were down, particularly to the communications device market. Also, sales of piezoelectric material components and circuit protection devices to the industrial equipment market declined. As a result, net sales were ¥128,011 million, a 14.6% year-on-year decrease.



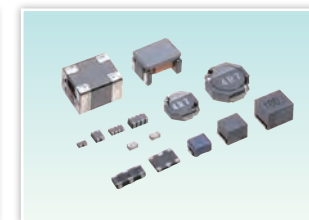
Ceramic capacitors



Aluminum electrolytic capacitors



Film capacitors



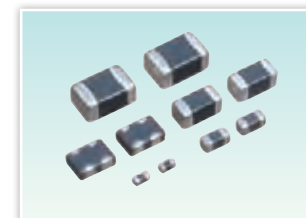
Inductive devices



High-frequency components and modules



Piezoelectric material components



Circuit protection devices



Sensors

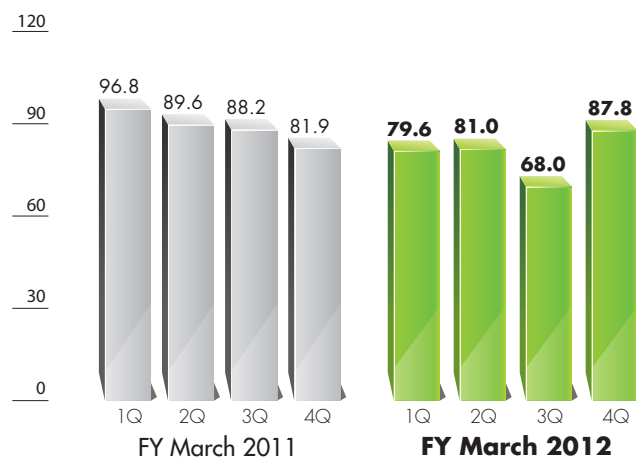
## Sales Results

## Magnetic Application Products

This business segment encompasses "Recording Devices" including HDD heads and related products, as well as "Other Magnetic Application Products" including power supplies and magnets.



Sales (billions of yen/quarter)

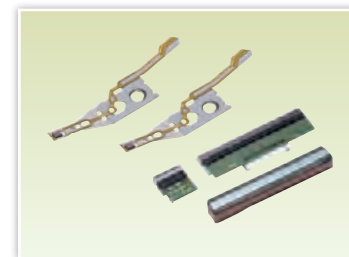


**Sales of other magnetic application products to the automotive market were strong, but sales of HDD recording devices declined, and net sales were down 11.2% from the previous fiscal year.**

Total net sales in the segment during the fiscal year ended March 31, 2012 were ¥316,402 million, a decrease of 11.2% from the previous year, and operating income was ¥39,028 million, down ¥12,397 million. Results by product segment are set forth below.

## Recording Devices

HDD production fell because of damage from the flooding in Thailand, and as a result sales of HDD heads, the main product in this segment, were down. Also, production and sales of HDD suspensions declined because of flooding damage to a plant in Thailand. In addition, declining prices and the appreciation of the yen against the U.S. dollar also had an impact, and net sales were ¥208,728 million, a decrease of 18.9% year-on-year.



Recording devices



Power supplies



Magnets



## Sales Results

## Applied Film Products

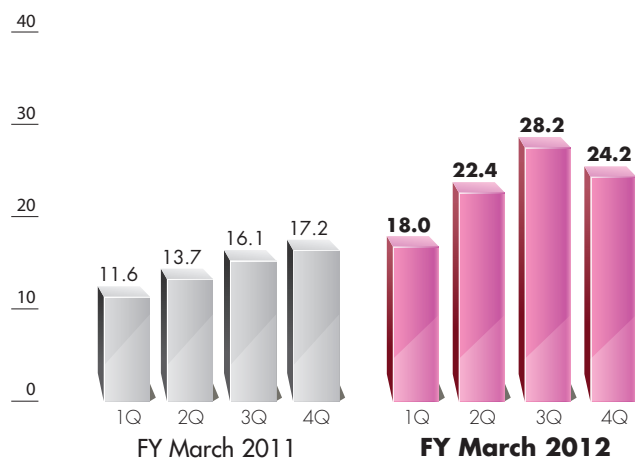
This business segment encompasses "Energy Devices (Rechargeable Batteries)" and "Applied Film Products" (formerly recording media).



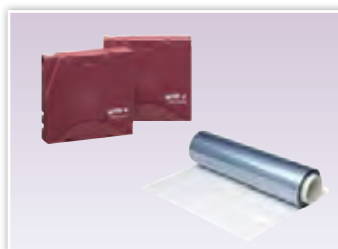
### Sales to the communications device market and home information appliance market were up sharply, resulting in a 58.2% year-on-year increase.

Net sales in this segment during the fiscal year ended March 31, 2012 were ¥92,727 million, an increase of 58.2% from the previous year, and operating income was ¥6,255 million, up ¥5,044 million. Sales of energy devices (rechargeable batteries) for communications devices, particularly smartphones and tablet computers, and home information appliances, increased substantially. Some recording media products that had been classified as magnetic application products were terminated, and separators, materials used in lithium batteries were added, causing the main recording media products to shift to functional films. As a result, sales in the new applied film products category to the communications devices market increased.

Sales (billions of yen/quarter)



Energy devices (rechargeable batteries)



Applied films

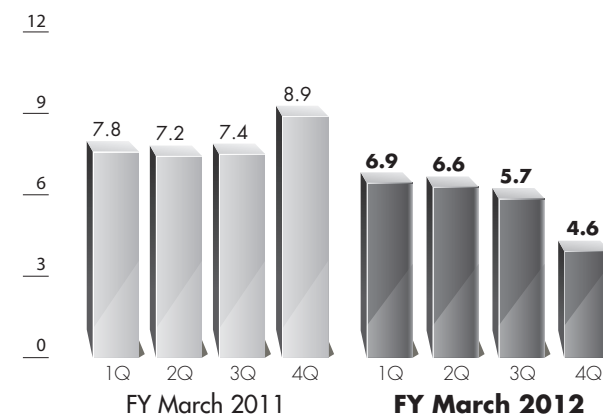
## Other

Other includes mechatronics (production equipment) and other businesses.



Net sales in this segment during the fiscal year ended March 31, 2012 sales declined 24.1% year on year to ¥23,792 million, and operating losses were ¥4,839 million, down ¥5,344 million.

Sales (billions of yen/quarter)



# Research & Development



## R & D Activities

### Concentrating technological resources on growth markets and promoting development on a worldwide basis

TDK is strongly focusing its research and development activities on new products and technologies geared to swiftly respond to the continuing advancement and diversification of the electronics sector. Key areas are products related to next-generation recording technology, micro electronics modules for mobile communications, and the application of materials technology and design technology for developing environmentally oriented and energy-saving devices for the automotive sector and for next-generation infrastructure applications. Technological resources are being allocated to vital markets including next-generation information communications and the energy sector, to realize efficient, solution-oriented research and development.

In the passive components sector, we have harnessed core technologies for the development of next-generation multilayer ceramic chip capacitors and inductors, EMC filters, and compound sheet type flexible magnetic shields and radio wave absorbers for anechoic chambers. As a result, we introduced various EMC countermeasure products to the market and advanced the performance of anechoic chamber facilities. Activities related to implementation of RF modules and other module products were also strengthened.

In the magnetic application product sector, the development of rare-earth-free magnets and next-generation ferrite magnets is progressing, along with the development of next-generation high-density recording heads. The development of devices for hybrid vehicles and electric vehicles is also being strengthened. In particular, the Great East Japan Earthquake has accentuated the need for energy-saving measures which have become a major concern for Japanese society. The development of highly efficient

power supplies is one way in which we are responding to such needs. As the price for rare earth source materials is rising due to the difficult international situation in producing areas, we are aiming to maintain our price structure by significantly reducing the use of rare earth elements or even eliminating them altogether in new types of magnets.

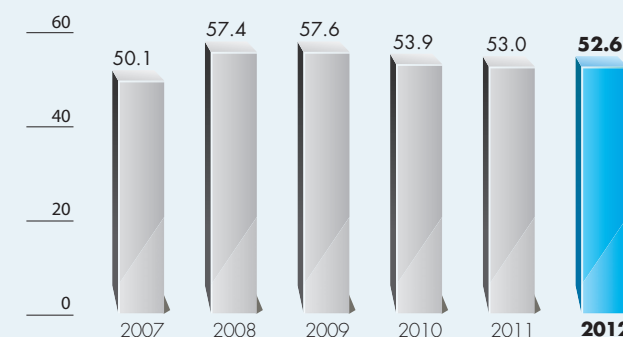
In the film application sector, the development of next-generation lithium batteries and film materials with new properties and functions is progressing.

The development flow at TDK encompasses the Material & Process Development Center, Devices Development Center, Application & Analysis Center, as well as the technology development resources of the respective business units. Each of these is engaged in dedicated work on new products and new technologies in their respective fields, while cooperation among departments is also being strengthened.

On the global stage, TDK promotes research and development in conjunction with major universities in the U.S. and Europe, and we are aiming at making increased use of local expertise and technology resources through R & D subsidiaries in various countries. In China, where we intend to strengthen our base and pursue an expansion of activities in future, we are carrying out research related to electronic component materials. As for R & D at other consolidated subsidiaries, we continue to strongly promote the development of next-generation HDD heads at Headway Technology, Inc. in U.S.

The expenditure for R & D activities in the fiscal year ended March 31, 2012 was 52,551 million yen (6.5% of net sales), which represents a 0.1% drop over the previous year.

R & D expenditure (Billions of yen)



Percentage of net sales (%)



Note: Fiscal years ended March 31

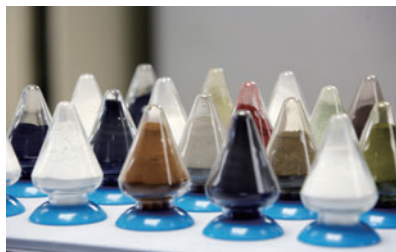
## Research &amp; Development

## Materials Technology

Pursuing the characteristics of materials on the atom level

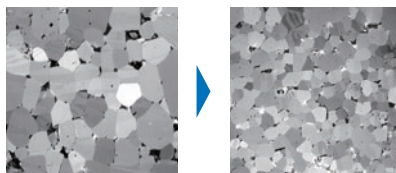
### Materials design technology

This technology utilizes control of main raw material composition as well as microadditives to achieve certain targeted properties during the development of magnetic materials, dielectric materials, and similar electronic materials.



### Powder control technology

Most raw materials for electronic applications are used in powder form. In order to achieve higher performance, various advanced techniques are applied to control properties such as base powder microstructure, uniformity, and dispersion on the nanometer level.



Neodymium magnet crystal grain structure

Finer and more uniform crystal grain results in improved magnetic characteristics.

### Microstructure control technology

Electroceramics such as ferrite are polycrystalline substances consisting of a large number of crystal grains. By controlling the internal composition of the crystal grain as well the boundary between particles and other properties, various characteristics can be realized.



Core (center) and shell (surrounding part) structure of dielectric ceramics particles

### Sintering technology

Electroceramics materials and magnetic materials are shaped and then sent to the sintering process to become the sintered compact. This requires extremely accurate environmental control, because the resulting microstructure is affected by factors such as temperature and gas components in the sintering oven.



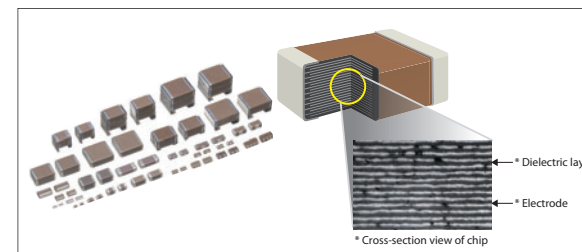
Sintering process of ferrite and temperature control

## Process Technology

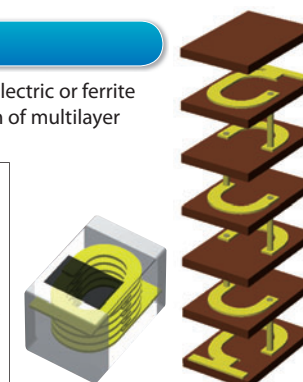
Making things ever smaller and thinner

### Thick-film process technology

A technique that involves printing paste type electrodes onto dielectric or ferrite sheets to create a multilayer structure. It is used in the production of multilayer ceramic chip capacitors and multilayer chip inductors.



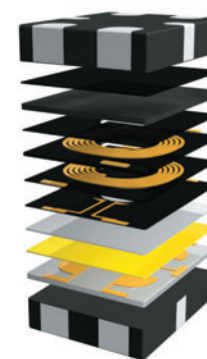
Multilayer ceramic chip capacitors and their structure



Structure of multilayer chip inductor

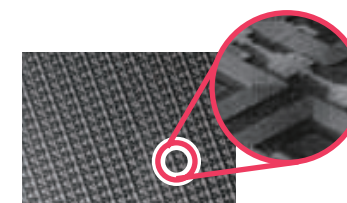
Multilayering technology creates a spiral-shaped coil within the chip.

### Thin-film process technology



Structure of thin-film common mode filter with ESD function

This technique involves creating a thin film on a wafer and using etching processing or a similar process to form an electrode, coil, head element etc. It is used in the production of magnetic heads for hard disk drives, thin film electronic components, etc.



Left: Thin-film common mode filter formed on wafer Right: Scanning electron microscope (SEM) photograph



HDD magnetic heads

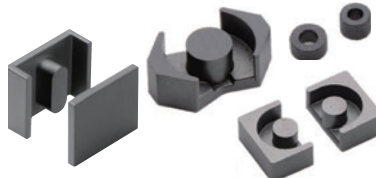
Head component at the tip is manufactured using thin-film process technology.

## Research &amp; Development

## Process Technology

## Shaping technology

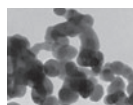
Ferrite cores, magnets, etc. are formed by adding a binder to the base powder. A high degree of technical sophistication is required to achieve compact, low-profile, complex shapes.



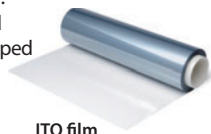
Ferrite cores of various shapes

## Coating technology

ITO film used for touch panels and similar is produced by uniformly coating the conductive material (powdered indium-tin-oxide) with a very thin plastic film. TDK can harness advanced coating techniques developed in the manufacture of magnetic tape and related products.



ITO powder



ITO film

## High-speed winding technology

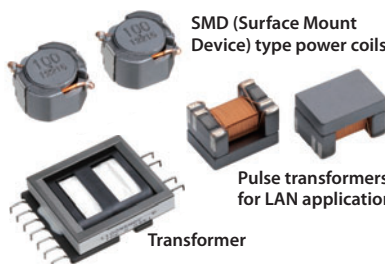
This technology is applied in the manufacturing process for film capacitors and other products, ensuring fast and highly precise winding of components such as the plastic dielectric film.



Film capacitor

## Winding technology

Automatization and optimization of winding process based on accumulated know-how result in a highly reliable products.



SMD (Surface Mount Device) type power coils

Pulse transformers for LAN applications

Transformer

## Electrode materials technology

Core technology know-how is also applied for internal electrodes of capacitors and electrodes for lithium polymer batteries.



Lithium polymer battery



Aluminum electrolytic capacitors

## Device &amp; Module Technology

Substrate embedding technology gives us an edge

## Circuit technology

This comprises selecting optimum components and designing the circuitry including the wiring and thermal dissipation arrangement using advanced simulation techniques.

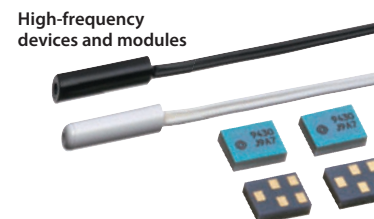


AC-DC switching power supply (PC board type)

Power module

## Packaging technology

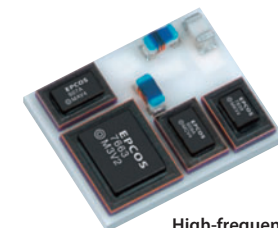
Parts assembly, matching, sealing, structural design, and shape design are optimized to achieve compact dimensions and high performance.



High-frequency devices and modules

## LTCC technology

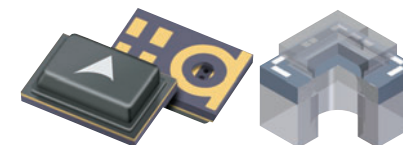
Low temperature co-fired ceramic (LTCC) technology allows the integration of a high number of components such as capacitors and inductors on a dielectric sheet to create a printed multilayer module.



High-frequency devices

## MEMS technology

Micro Electro Mechanical Systems technology involves configuring sensor, actuator, and similar functions on a chip to create a very compact functional device, using micro machining.



MEMS microphone

MEMS pressure sensor

## IC embedding (SESUB) technology

This technology involves embedding ICs and other components as well as the wiring into the substrate itself, to achieve a modular product.



Power supply module



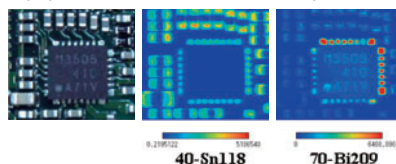
## Research &amp; Development

## Evaluation and Simulation Technology

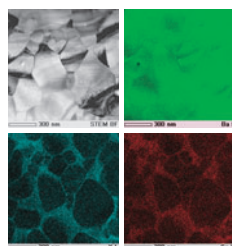
Ranging from material analysis and examination to simulation of product structure, thermal conditions, and electromagnetic field

### Evaluation and analysis technology

Tasks such as observation of microstructure and visualization of elemental distribution are carried out using the latest analysis equipment and simulation techniques.



Element imaging technology for components mounted PCBs



Elemental distribution evaluation of capacitor material

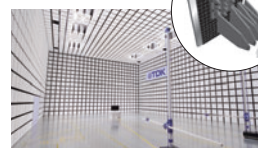
### EMC countermeasure technology

EMC measures are aimed at ensuring that a device is not susceptible to interference from other devices and also does not become the cause of interference in other devices. Such measures are implemented using common mode filters and a range of other EMC countermeasure products. TDK is also a leading provider of anechoic chambers, which use radio wave absorbers and are essential for noise measurements and the evaluation of electronic equipment and antennas.

#### Antenna evaluation



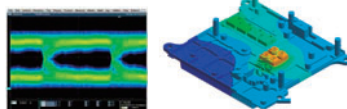
#### Unit type compound radio wave absorber



Ultra-high-performance 10 meter method anechoic chamber

### Simulation technology

Harnessing the power of computers to visualize the distribution of thermal energy emitted by circuits, or the electromagnetic field distribution of noise sources is helpful in designing products more efficiently and ensuring EMC compliance.



Noise measurement Simulation with thermal analysis



## Equipment Development Technology

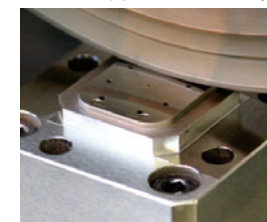
Promoting a unified production system starting from source material for further improvements of QCD (Quality, Cost, Delivery).

### Equipment technology

Outstanding products come from outstanding manufacturing facilities. TDK not only develops innovative manufacturing techniques but realizes these by building much of the required equipment in-house. This comprehensive approach is the key to superior craftsmanship.



Design



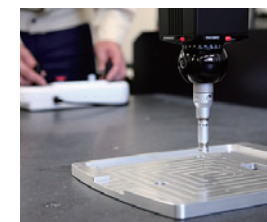
Die machining



Micro machining



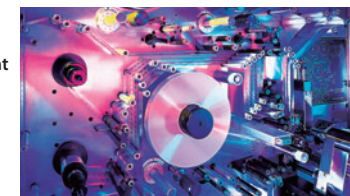
Assembly



Inspection



TDK factory automation equipment (flip-chip mounter/FOUP load port)



High-speed/high-precision automatic winder used for film capacitor manufacturing

# Group Management

## Corporate Governance

### Adoption of Company Auditor System and Strengthening the Supervisory Function

TDK has adopted the Company Auditor System pursuant to the Companies Act of Japan and has appointed three independent outside Company Auditors who have no conflicts of interest in order to enhance the supervision of management.

### Strengthening the Function of the Board of Directors and Holding Directors More Accountable

TDK has a small number of Directors (seven) to expedite management decision-making. At the same time, TDK has appointed three independent outside Directors who have no conflict of interest in order to enhance the supervision of management. In addition, the Directors' term of office is set at one year to give shareholders an opportunity to cast votes of confidence regarding Directors' performance every business year.

### Adoption of Corporate Officer System for Expeditious Business Execution

TDK has adopted a Corporate Officer system that separates the management decision-making and Director supervisory functions of the Board of Directors from the execution of business. Corporate Officers are in charge of business execution and carrying out decisions by the Board of Directors, thereby expediting business execution in line with management decisions.

### Establishment of Advisory Bodies to the Board of Directors (Business Ethics & CSR Committee, Disclosure Advisory Committee, Compensation Advisory Committee, Nomination Advisory Committee)

The aim of the Business Ethics & CSR Committee is to ensure implementation of the TDK Corporate Motto and the thorough application of business ethics, and to improve awareness of corporate social responsibility (CSR). To achieve this aim, the Directors, Company Auditors, Corporate Officers and all other members of the TDK Group are made fully conversant with the TDK Corporate Motto and Corporate Principle ("Vision""Courage""Trust") as TDK's management philosophy, and the TDK Code of Ethics, which stipulates concrete standards and guidelines for compliance with the letter and spirit of all laws, international regulations and social norms.

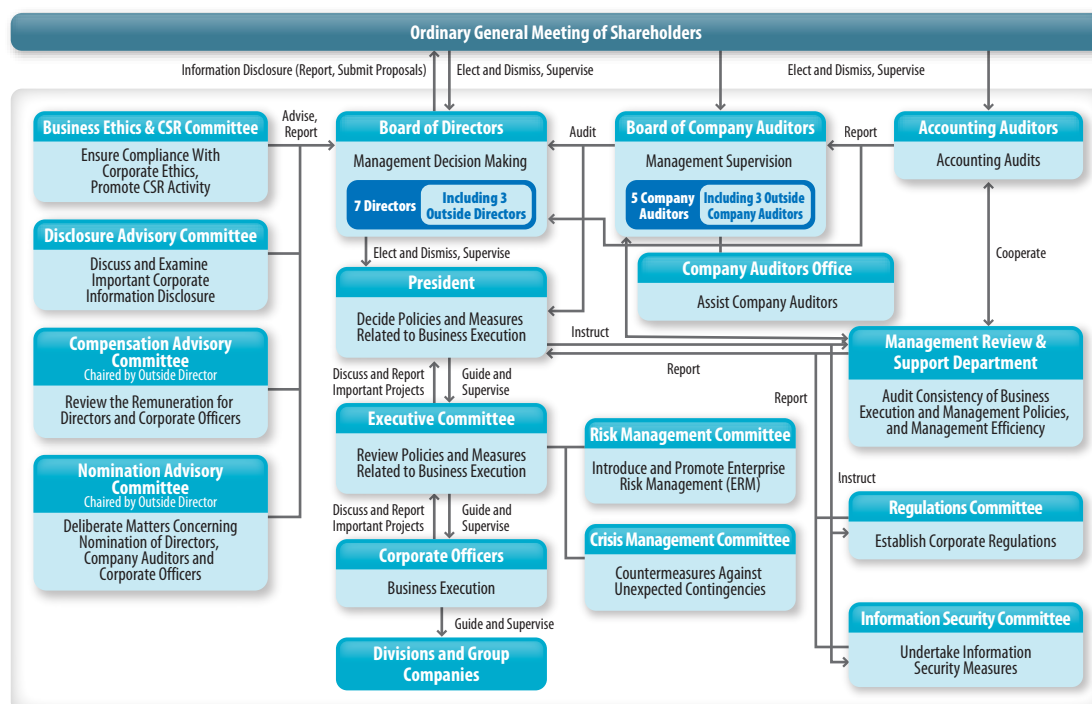
The Disclosure Advisory Committee reviews and examines important corporate information and disclosure materials

required for investment decisions by shareholders and investors, to ensure that TDK conducts comprehensive, appropriate, timely and impartial disclosure in accordance with various laws and regulations regarding securities transactions and the rules and regulations of the stock exchanges where TDK's shares are listed.

The Compensation Advisory Committee, which is made up of the outside Directors (1 of whom chairs the committee) and outside specialists, examines the composition of remuneration and the remuneration system pertaining to Directors and Corporate Officers, as well as presidents and qualifying executive officers of principal TDK subsidiaries. It also verifies the transparency of the remuneration decision-making process, as well as the reasonableness of individual remuneration levels in light of corporate business results, individual performance, and the general standards of other companies.

The Nomination Advisory Committee, which is chaired by an outside Director of TDK, discusses the conditions expected with regard to nominations for the post of Director, Company Auditor or Corporate Officer and makes nominations. In this way it helps ensure the appropriateness of the selection of Directors, Company Auditors and Corporate Officers, and the transparency of the decision-making process.

## Structure of Corporate Governance



## Group Management

## Compliance

### Comprehensive Distribution of Information on the TDK Code of Ethics Raises Awareness Concerning Compliance

Businesses must act as good corporate citizens in compliance with laws, regulations, and other social norms and maintain impartiality and fairness in their dealings with society. This must all be based on an awareness of their social existence supported by customers, shareholders, suppliers, local communities, employees, and other stakeholders.

TDK has organized these concepts in the TDK Code of Ethics and calls on all Group personnel to act in strict compliance with the standards in the Code. The Business Ethics & CSR Committee works to make all personnel thoroughly cognizant of the TDK Corporate Motto, Corporate Principles, and Code of Ethics, representing TDK's management philosophy, as well as to put the motto "Contribute to culture and industry through creativity" into full practice.

As part of this program, during the fiscal year ended March 2012, TDK fully revised the Code of Ethics Handbook and distributed them to all Group employees.

## Risk Management

### Companywide Risk Management System Introduced to Reduce Risks and Improve Operations

At TDK, the Risk Management Committee works directly under the Executive Committee to promote companywide enterprise risk management (ERM). It specifies 50 risk items involved in the Group's corporate activities, including risks relating to natural disasters, such as earthquakes and flooding; risks relating to contagious diseases, such as new strains of influenza; risks relating to product quality; and risks relating to the procurement of raw materials, etc.

The Risk Management Committee conducts activities to ensure a proper response to these items. In particular, it is revising the Group's business continuity plan (BCP) and promotes cross-sectional and companywide activities aimed at reducing risks that hinder the achievement of business objectives. If a crisis does unexpectedly occur, TDK will take the necessary countermeasures centered on the Risk Management Committee.

In addition, regarding individual risks that should be dealt with by the function or Business Group concerned (legal, financial, information technology, environmental risks, etc.), TDK stipulates operational rules in companywide standards, detailed rules, and procedures and Business Group procedures.

The Corporate Officers in charge of business execution take responsibility for handling risks relating to daily business under their jurisdiction.

Furthermore, Company Auditors and the Management Review & Support Department, which is TDK's internal auditing body, monitor the implementation of countermeasures and offer advice on how to effectively reduce risks to business operations. Advice on new adverse factors that may affect the Group is also received constantly from specialists such as TDK's advisory lawyers.

In the fiscal year ended March 2012, TDK compiled guidelines concerning the sale of products to customers in specialized fields where risks relating to human life are especially high.



## Group Management

(As of June 28, 2012)



Back row,  
from the left:

**Makoto Sumita**  
Outside Company Auditor

**Osamu Yotsui**  
Company Auditor

**Noboru Hara**  
Company Auditor

**Osamu Nakamoto**  
Outside Company Auditor

**Koichi Masuda**  
Outside Company Auditor

Front row,  
from the left:

**Yukio Yanase**  
Outside Director

**Kenichi Mori**  
Outside Director

**Atsuo Kobayashi**  
Director

**Takehiro Kamigama**  
Representative Director

**Hiroyuki Uemura**  
Director

**Junji Yoneyama**  
Director

**Ryoichi Ohno**  
Outside Director



## Group Management

(As of June 28, 2012)

## Corporate Officers



**Takehiro Kamigama**  
President and CEO,  
and General Manager of  
Electronic Components  
Sales & Marketing Group



**Raymond Leung**  
Executive Vice President  
General Manager of China  
Operation Group



**Atsuo Kobayashi**  
Executive Vice President  
General Manager of  
Corporate Planning Group  
and General Manager of  
Corporate Planning Dept.



**Hiroyuki Uemura**  
Executive Vice President  
TDK-EPC President & CEO,  
General Manager of  
Ceramic Capacitors Business  
Group, and General Manager  
of Magnetics Business Group



**Shinichi Araya**  
Senior Vice President  
General Manager of  
Technology HQ and  
General Manager of  
Management System Group



**Seiji Osaka**  
Senior Vice President  
TDK-EPC SEVP\* & COO



**Yoshiaki Hirota**  
Senior Vice President  
General Manager of  
Power Systems  
Business Group



**Takaya Ishigaki**  
Corporate Officer  
In charge of Materials &  
Process Development,  
and General Manager of  
Material & Process  
Development Center of  
Corporate R&D Group,  
Technology HQ



**Shinya Yoshihara**  
Corporate Officer  
General Manager of  
Production Engineering  
Center



**Junji Yoneyama**  
Corporate Officer  
In charge of Export and  
Import Control, and  
General Manager of  
Administration Group, and  
General Manager of Human  
Resources Department



**Robin Zeng**  
Corporate Officer  
General Manager of Energy  
Devices Business Group



**Masataka Kajiya**  
Corporate Officer  
Deputy General Manager  
of Electronic Components  
Sales & Marketing Group



**Kaoru Matsuoka**  
Corporate Officer  
General Manager of Corporate  
R&D Group, and General  
Manager of Devices  
Development Center, and  
General Manager of Corporate  
Technology Planning Dept.,  
Technology HQ



**Noboru Saito**  
Corporate Officer  
Deputy General Manager  
of Electronic Components  
Sales & Marketing Group



**Takakazu Momozuka**  
Corporate Officer  
General Manager of Finance  
& Accounting Department



**Mitsuru Nagata**  
Corporate Officer  
Deputy General Manager  
of Electronic Components  
Sales & Marketing Group



**Joachim Zichlarz**  
Corporate Officer  
TDK-EPC  
SEVP\* & CFO



**Joachim Thiele**  
Corporate Officer  
Deputy General Manager  
of Electronic Components  
Sales & Marketing Group

※SEVP: Senior Executive Vice President

## CSR Activities

### CSR Philosophy

#### Promoting CSR activities through business activities based on TDK Code of Ethics

For the TDK Group, CSR efforts take shape through the implementation of our corporate motto and the thorough pursuit of corporate ethics. This means always maintaining proper channels of communication between customers, suppliers, employees, shareholders/investors, local communities, and other stakeholders. The TDK Code of Ethics serves as the overall framework guiding our actions as we fulfill our responsibilities.

By putting these principles into practice, we increase the value of our business, contributing to both the continued evolution of this business and the creation of a sustainable society.

### Quality Assurance

#### Becoming a quality leader through the pursuit of zero defects

Quality assurance at TDK is based on the pursuit of a zero defects policy throughout the entire lifecycle process. This does not end with the finished product but continues

through subsequent stages including shipping, distribution, assembly and processing at end product manufacturers, use by customers, and finally disposal.

We believe that simple inspection "after the fact" is not enough to ensure quality. Rather, forward-oriented thinking begins at the development and design stage and informs the entire process. The pursuit of zero defects and ambition to become the industry's quality leader inspire our day-to-day activities.

### Cooperating with Socially Responsible Investment (SRI)

TDK stock is included in the Dow Jones Sustainability Asia Pacific Index, launched jointly by SAM Group Holding (Switzerland) and Dow Jones & Company (U.S.A.), as well as in the Morningstar Socially Responsible Investment Index (MS-SRI), which is Japan's SRI indicator. (Current as of April 2012)

### Improvement and Protection of Environment

#### Implementing global business activities focused on a conservation-based environmental vision

TDK believes a long-term vision is essential to achieve sustainable development and a closed-loop economy. The entire Group is guided by the TDK Environment Protection Charter and implements this philosophy through concerted hands-on action.

In April 2011, the Group began implementing the new TDK Environmental Action 2020 plan. Targets were set to achieve carbon neutrality for the first time in the electronic components industry. TDK is focusing on reducing carbon dioxide (CO<sub>2</sub>) emissions through its products to reduce the company's environmental footprint. That means both minimizing CO<sub>2</sub> output at manufacturing facilities and contributing to society products and know-how that will reduce emissions. We will continue to promote environmental activities with the goal of reaching carbon neutrality by the end of fiscal 2020.

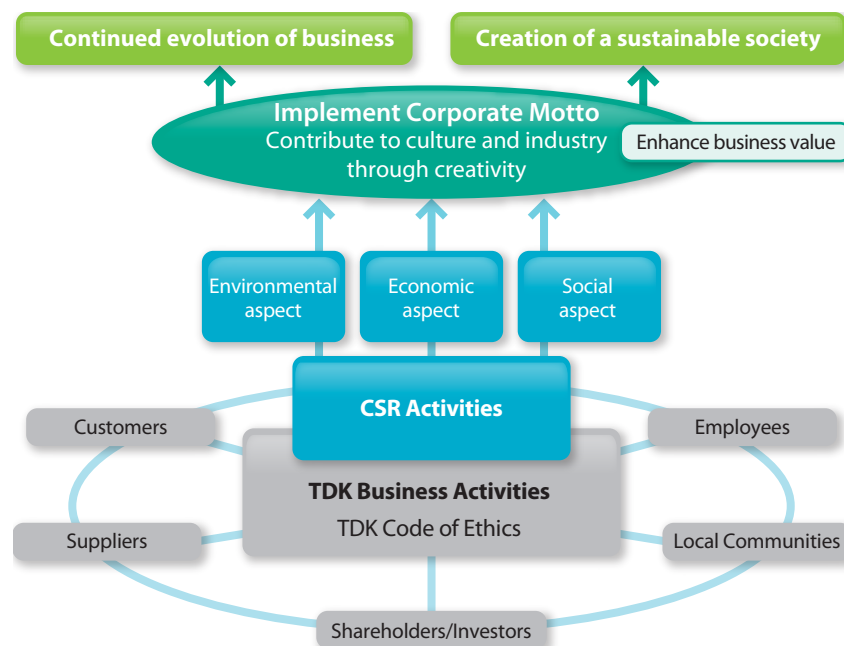
### CSR and Procurement

#### Assessing supplier CSR through a Web-based framework

TDK operates a Supplier Partnership System designed to allow a comprehensive assessment of CSR activities by our suppliers. The system uses 60 carefully designed evaluation questions based on selected items from the Supply Chain CSR Promotion Guidebook, published by the Japan Electronics and Information Technology Industries Association (JEITA).

The assessment questions, which are reevaluated every year, focus on the areas that matter most to TDK, such as human rights and labor relations, the environment, fair trade and ethics, and information security. In the fiscal year ended March 2012, about 1,693 companies in Japan and 1,025 companies overseas cooperated in the management assessment process.

#### CSR and Ethics Framework



## CSR Activities

**Reducing CO<sub>2</sub> emissions in manufacturing**

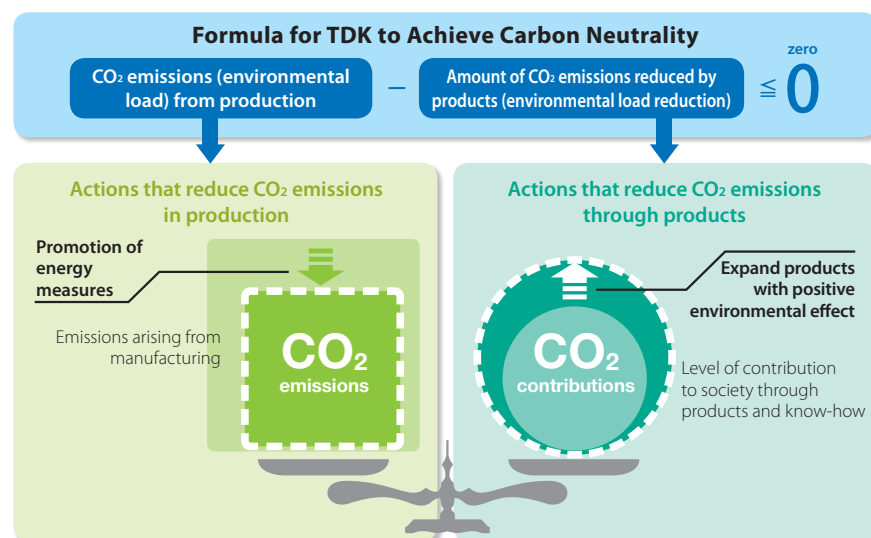
Fifty percent of TDK's CO<sub>2</sub> emissions come from the Chugoku region of Japan, where intensive energy-saving measures have been implemented.

**Expanding products that help to reduce CO<sub>2</sub> emissions**

TDK contributes products and know-how to society that focus on reducing CO<sub>2</sub> emissions, and is working to establish standards by which to quantify their impact on lightening the world's environmental load.

Quantification standards to measure reductions in environmental impact are important in electronic components not only for TDK but for the entire components industry. For this reason, TDK is working with industry organizations to develop common standards and promote their widespread use.

In fiscal 2011 the quantification of emissions reductions was completed for certain TDK product groups, and efforts will continue in fiscal 2012 to establish standards for all quantifiable product groups and carry out calculations.

**Social Contributions****Promoting Social Contributions by Staff through Awards Framework**

As a corporate citizen, TDK endeavors to contribute to society in various ways, focusing particularly on the following four areas: Academic Research and Education;

Sports, Arts, and Culture; Environmental Conservation; and Social Welfare and Local Community Service.

In fiscal 2005, the company started the TDK Group Social Contribution Award program. In fiscal 2012, there were 35 applications, 11 of which were selected for an award (including two natural disaster preparedness awards).



The promotion of hiring of people with hearing impairments and support for them in the workplace (TDK-Lambda Corporation, Nagaoka Technical Center)



Donations for giving Christmas presents to disadvantaged children (TDK Corporation of America)



Donations of drinking water to areas affected by flooding in Thailand (Magnecomp Precision Technology Public Co., Ltd.)



The planting of 100 seedlings on World Environment Day (June 5) (EPCOS India Private Ltd.)

Note: Besides the above examples, 7 more social contribution activities were selected for an award.



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<http://www.tdk.co.jp/>