

Editor's Desk

Dear Reader,

Deki is now twenty. We have, during the last twenty years, had the privilege of offering our film capacitors to a dynamic and growing market. Beginning with film/foil inductive capacitors in 1984, Deki's product basket today includes the full range of film capacitors in dip, powder and box encapsulations.

Earlier the most common dielectrics used in film capacitors were

- PET—Polyethylene Terephthalate
- PS—Polystyrene
- PC—Polycarbonate.

When polystyrene film production was phased out across the world, Deki introduced PP film (polypropylene film) capacitors. These have found wide usage in high frequency applications especially in the lighting electronics sector.

Improved product designs in the lighting and automotive sector have led to a growing demand for components that can withstand higher operating temperatures. In order to address this demand Deki has now introduced mixed dielectric film capacitors. These capacitors offer an even better stability with respect to temperature compared to PP film capacitors.

We have also introduced PPS (polyphenylene sulphide) and PEN (polyethylene naphthalate) capacitors where the operating temperature can go as high as 140°C.

This issue of Charge is devoted to three of these new capacitors, PEN, PEP and MPEP.

As usual, we look forward to your comments and suggestions.

Amil Bali

Deki at Componex India

Deki participated in Componex India at Pragati Maidan, New Delhi from February 12 to 15, 2004. A number of significant players from the electronic industry visited our stall. The forthright theme of "Why import" seemed to have hit the right chord with a lot of customers seeking competitive components from Indian manufacturers.

Concurrent to Componex, Deki organised three seminars which were really appreciated by the audience. The seminars were on:

- World of Film Capacitors,
- Film Capacitors for Lighting, and,
- Film capacitors for Fan Regulators.

Our Technical Manager, Mr P Sankar Raj made the presentations extremely interesting and very easy to understand with tips to designers on how to make the appropriate application based capacitor selection.

Deki Gets ISO 9001-2000

Deki was audited by BIS for Renewal-cum-Switchover Audit on December 15 and 16, 2003. The audit team recommended Deki's Quality System for ISO 9001-2000 certification.

As you may recall, Deki has been running its operations as per ISO 9002 since 1994.

Deki's Health and Safety Initiative



All Deki employees were medically examined by doctors from the neighbouring Sumitra Hospital in Noida. In addition to regular parametric checks, employees were also examined for any occupational hazards. A report along with advice/reference was given to all employees.

Quality Day at Deki

To emphasise the need for providing 'Defect Free Products' to our customers Deki organised the Annual Quality Day on July 28, 2004. Inaugurated by our Chairman, Mr Jai Kumar, the keynote address was delivered by Mr S K Neogi, Vice-President (Operations), Phoenix Lamps India Ltd, one of our esteemed customers. Mr Neogi spoke about changing customer's expectations and the need to develop a passion and an ownership for our jobs.



Heads of Departments made presentations on:

- Quality: Changing Customer Expectation
- Definition of Quality
- Quality:Your Role
- Quality Systems
- Review of Customer Complaints in 2003-04
- Statistical Process Control at Deki
- PDCA as a Tool for any Improvement Activity.



New Products

- Pen Film Capacitor for high temperature applications.
- PEP capacitor for linear temperature co-efficients.
- MPEPP capacitor for linear temperature co-efficients.

Comparison of Dielectrics:

Characteristics	PET	PP	PEN	PPS
Max Operating Temp.	125°C	100°C	140°C	140°C
Tan δ @1 kHz	0.003	0.0002	0.003	0.0006
Permittivity@1 kHz	3.2	2.2	3.0	2.9

For very high heat resistance the ideal choice is PEN (or) PPS.

Film/Foil Polyethylene naphthalate (PEN) Capacitor

Application: General purpose application like bypassing, signal coupling, high reliability at high temperature.

Capacitance Value: 0.001 Mfd to 0.022 Mfd

Rated Voltage: 400VDC, 630 VDC, 1000 VDC

Capacitance Tolerance: $\pm 5.0\%$, $\pm 10.0\%$

Category Temperature Range: -55°C to +125°C

Climatic Category: 55/125/21

Voltage Proof: 2 times of the rated voltage for 60 seconds

Insulation Resistance $U_R > 100$ VDC: (30,000 M Ω)

Dissipation Factor:

1 kHz	\leq	0.6%
10 kHz	\leq	1.0%
100 kHz	\leq	2.0%

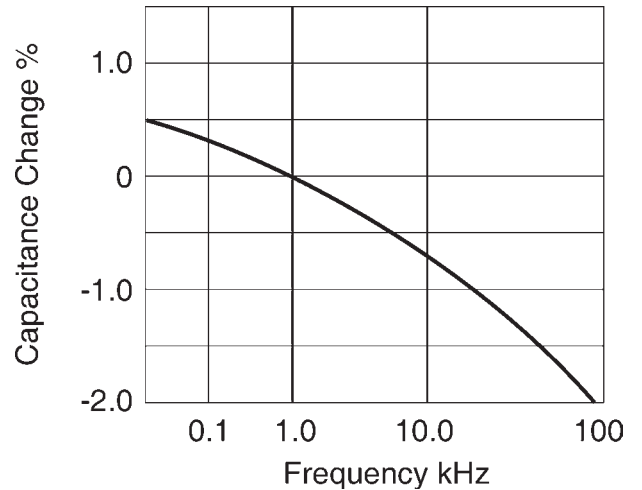
Life Test Condition: Loaded at 125°C, 1.5 times of the category voltage (category voltage is 80% of rated voltage) for 2000 hours.

Requirement after the test

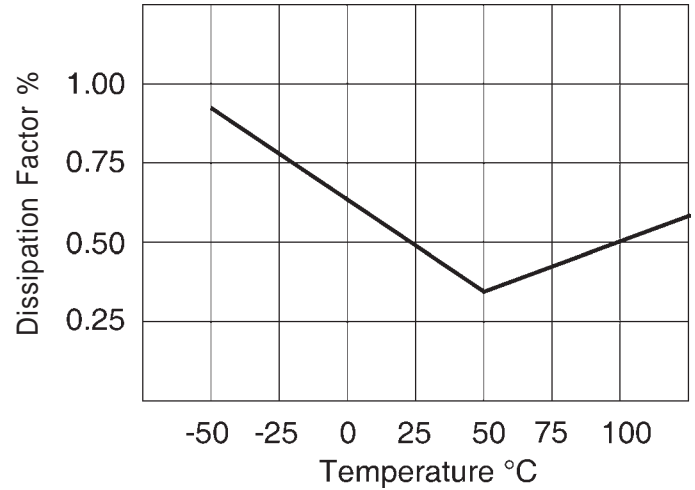
Change in Capacitance: $\leq 10\%$ of initial value

Dissipation factor: ≤ 1.2 times of the initial value

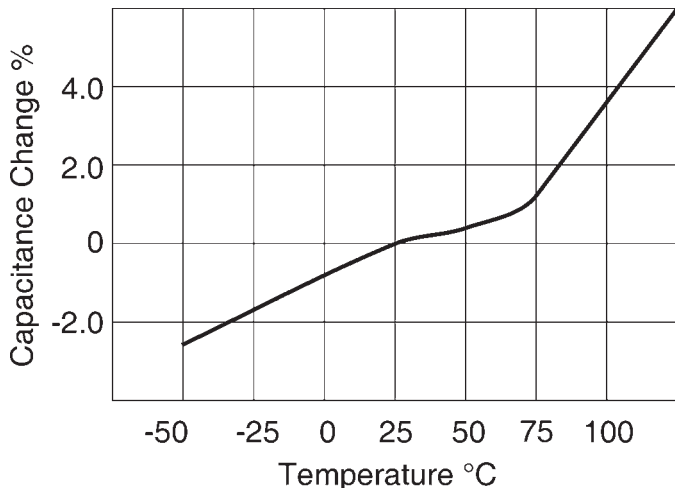
Insulation Resistance: > 15000 M Ω



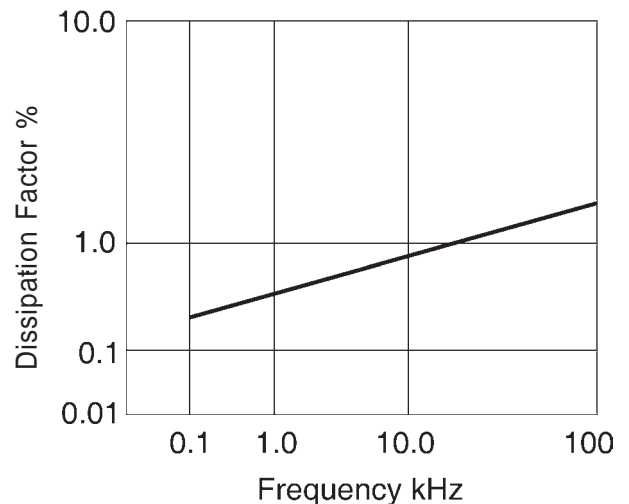
Capacitance Change with reference to Frequency.



Dissipation Factor vs. Temperature.



Capacitance Change with reference to Temperature.



Dissipation Factor vs. Frequency.



Film/Foil Polyester/Polypropylene (PEP) Capacitor (Mixed Dielectric)

Application: Timing and tuning circuits where flat temperature characteristics are required.

Capacitance Value: 0.001 Mfd to 0.022 Mfd

Rated Voltage: 100VDC, 400 VDC, 630 VDC

Capacitance Tolerance: $\pm 1.0\%$, $\pm 2.5\%$, $\pm 5.0\%$

Category Temperature Range: -55°C to 100°C

Climatic Category: 55/100/21

Voltage Proof: 2 times of the rated voltage for 60 seconds

Insulation Resistance $U_R > 100$ VDC: (30,000 M Ω)

Dissipation Factor:

1 kHz	\leq	0.5%
10 kHz	\leq	0.8%
100 kHz	\leq	1.5%

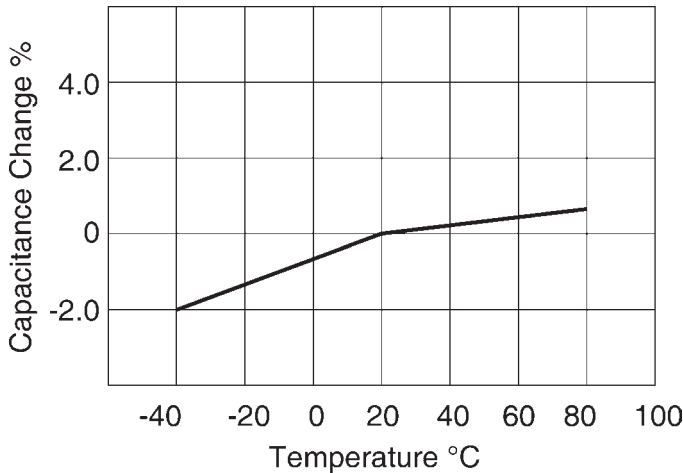
Life Test Condition: Loaded at 100°C at 1.5 times of the category voltage (category voltage is 80% of rated voltage) for 2000 hours.

Requirement after the test

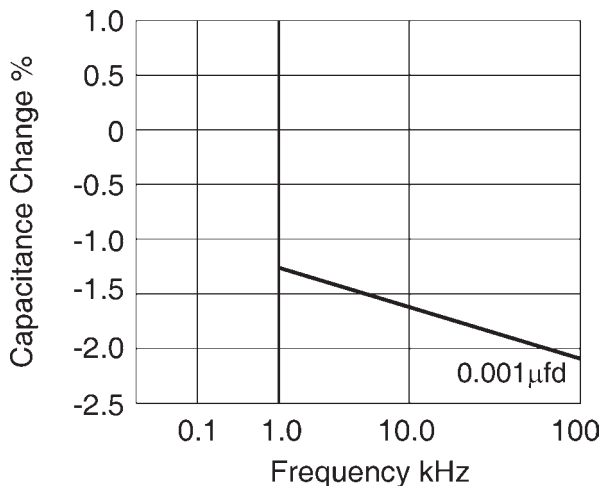
Change in Capacitance: $\leq 10\%$ of initial value

Dissipation factor: ≤ 1.2 times of the initial value

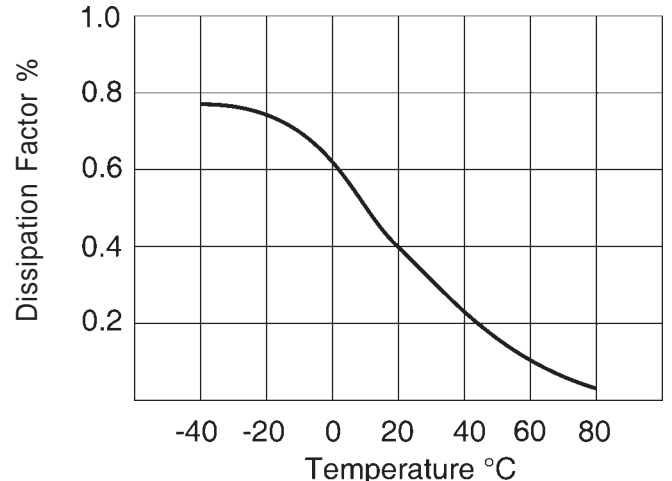
Insulation Resistance: > 15000 M Ω



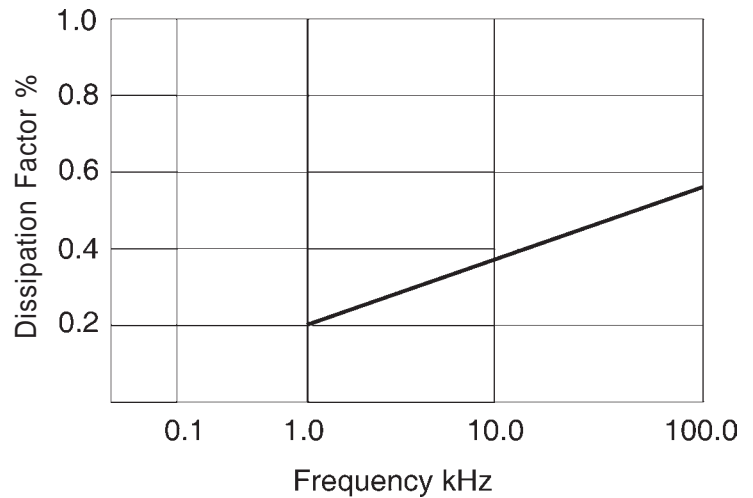
Capacitance Change with reference to Temperature.



Capacitance Change with reference to Frequency.



Dissipation Factor vs. Temperature.



Dissipation Factor vs. Frequency.

Metallised Polyester/Metallised Polypropylene (MPEP) Capacitor (Mixed Dielectric)

Application: Timing and tuning circuits where flat temperature characteristics are required.

Capacitance Value: 0.1 Mfd to 4.5 Mfd

Rated Voltage: 100VDC, 250 VDC, 400 VDC

Capacitance Tolerance: $\pm 2.5\%$, $\pm 5.0\%$

Category Temperature Range: -55°C to 100°C

Climatic Category: 55/100/21

Voltage Proof: 1.6 times of the rated voltage for 60 seconds

Dissipation Factor:

1 kHz	\leq	0.6%
10 kHz	\leq	1.3%
100 kHz	\leq	2.0%

Life Test Condition: Loaded at 100°C at 1.25 times of the category voltage (category voltage is 80% of rated voltage) for 2000 hours.

Requirement after the test

Change in Capacitance: $\leq 5\%$ of the initial value.

Dissipation factor: ≤ 1.2 times of the initial value

Insulation Resistance: $> 50\%$ of the value specified.



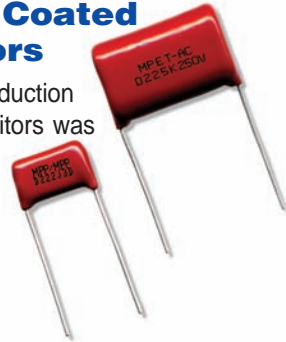
Deki Introduces Powder Coated Metallised Film Capacitors

A fully automated line with an annual production capacity of 25 million metallised film capacitors was installed at Deki in February 2004. The capacitors are powder coated in brown colour and then ink jet marked.

Latest Taiwanese winding machines and the Korean welding, testing and marking machines ensure excellent and consistent quality, substantiating Deki's claim of a 'Single Digit PPM' company.

Now all the three lines at Deki are truly world class. These are:

- Inductive Line
- Non Inductive Metallised Line.
- Miniature Box Line.



Customer Satisfaction Survey (July 2003 to Jan 2004)

According to the last Customer Satisfaction Survey, we had improved our performance by 6% points. This time the CSS was sent to the top 50 customers and their inputs are being used to improve our performance further, especially in the area of delivery.

Manufacturing CLIP and Customer CLIP are being used to monitor performance. With the introduction of a planned 'scheduling system' machine loadings are being optimised, resulting in reducing the TPT and improving the Manufacturing and Customer CLIPs.

Deki at Cliktronica '04

Deki is participating at Cliktronica '04 in Bangalore from August 6 to 8, 2004. You are invited to visit us at stall no 99.

This 5th exhibition of electronics and IT hardware is being held at the Palace Grounds in Bangalore.

Deki at Electronica, Munich in November 2004

After a successful participation in Electronica, Munich 2002 as a part of the CBI group Deki will be present again in Munich from November 9 to 12, 2004 as part of the CBI programme.

We hope this participation will help us to increase our exports from today's level of 25% to over 40% of our turnover within the next two years.

Deki's Environmental Initiative

Deki has been awarded the 'Green Partner' certificate by Sony India. The certificate, issued by the Procurement Global Head Office of Sony Corporation, Japan, endorses that Deki has established an environmental management system meeting requirements of the Sony Green Partner Program.

Deki's Performance : Stepping on the Gas

Deki's turnover grew by 20% during the last fiscal year. The business plan for 2004-2005 targets an aggressive growth of 40%. We are happy to note that performance during the first quarter is in line with the target.

Exports are estimated to contribute an estimated 25% of the turnover during 2004-05.

Deki's Expansion Plans

In line with Deki's plan of top line growth of more than 40% every year the following expansions are planned during this year:

1. An additional 25 million pieces/annum of metallised polyester capacitors. Machines are expected in house by March 2005.
2. 60 million pieces/annum of film foil with machines expected in house by January 2005.

With this the total installed capacity of Deki will go up to 241 million pieces per annum from today's level of 156 million pieces per annum.



< Powder coating machine



New winding > machines



< Imaje marking machine



Fully automatic > welding machine