

CHARGE

October 2012

A Technical News Journal from Deki Electronics Ltd

Editor's Desk

Dear Reader,

Deki is India's largest manufacturer of film capacitors and we have enhanced our production capacity to 1.2 billion pieces per annum effective 1st October 2012. We are pleased to share pictures of some of the new machines that will help us in making this increase possible.

On the product front, some of our customers manufacturing industrial energy meters informed us that they were facing problems of change in capacitance value in capacitors used in energy meters in coastal areas. The Deki R&D team took this as a challenge and developed a capacitor suitable for areas experiencing high humidity.

Other product developments at Deki include power factor correction capacitors (10mm pitch) and metallised poly-propylene capacitors for low frequency AC application in CFLs, electronic ballasts and LEDs.

We share details about these three capacitors in this issue of Charge.

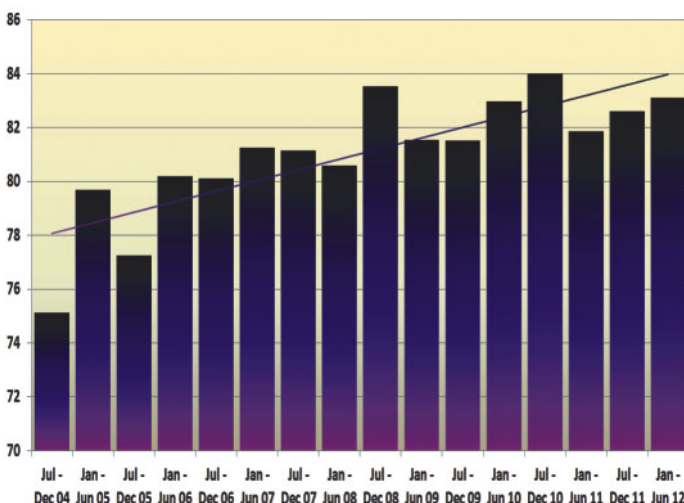
And, as always, we look forward to your comments and suggestions.

Anil Bali

External Customer Satisfaction Survey

Deki conducts an external customer satisfaction survey every six months. The results of the last survey for the period Jan-July 2012 indicated another term of a consistently improving trend. We have been carrying out this survey for the past eight years and our customers have acknowledged the improvements made by Deki on their suggestions. This is borne out by the improving trend in our score from 75% in July-Dec 2004 to 83% in Jan-June 2012.

We will also redouble our efforts to further enhance your perception of Deki as a supplier who can add more value to your business.



External customer satisfaction survey results

Employee Motivation Survey

Readers may be aware that Deki also conducts an Employee satisfaction survey every six months. In this survey all the direct employees are asked fifteen questions pertaining to:

1. their work environment
2. salary
3. satisfaction level
4. growth opportunity
5. knowledge of targets, standard specifications, operating procedures, etc.

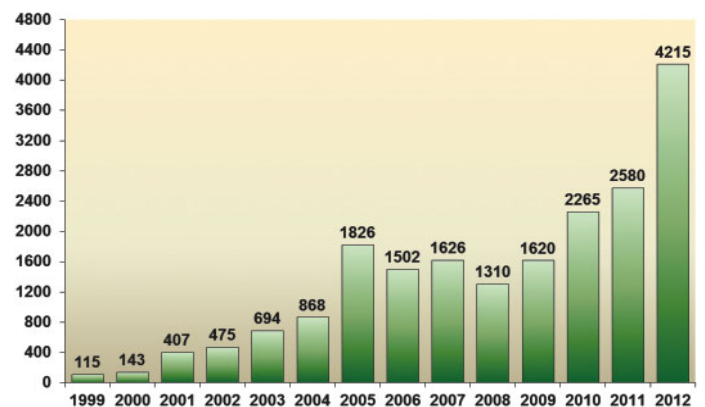
They give marks to each of the questions and this is then consolidated and made into a report that compares the results of the most recent survey with that of the previous months. The consolidated report, along with the action points for improvement, are discussed with all the employees in an "Open House" by our Managing Director, Mr Vinod Sharma.

The February 2012 survey showed an increase of 2%, from 86% to 88%, in the total score. While improvements were noticed across all sectors, the three areas that stood out were:

1. working conditions
2. grievance handling, and,
3. importance accorded as a member of Deki team.

Training in Deki

Training in Deki has been growing consistently. In the first eight months of 2012 training hours went up from 2580 hours to 4215 hours - an increase of 63%. This translates into a very healthy 2.8 manhours of training per person per month. Detailed stagewise training is being conducted in which knowledge of the process and the machines is being imparted. This is followed by a written test. An employee has to score a minimum of 80% at critical stages to qualify to operate the machine.



Deki spends a considerable amount of time in training

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Capacitors with High Capacitance Stability for Energy Meter Applications

High Capacitance Stability MPET Capacitors (AC Voltage and for Low Frequency Applications)

Characteristics: Metallised polyester film, non-inductive winding coated with flame retardant grade epoxy resin, up to 310 V AC, 50/60 Hz, high capacitance stability.

Typical Value: 0.41µf / 310 V AC.

The design performs very well at high temperature and very high humid environments but it is not suitable for across the line AC applications.

Rated temperature: 85° C.

Maximum Operating Temperature: 100° C.

Between 85° C and 100° C, a derating of 1.25% per °C has to be applied on the rated voltage.

Voltage Proof: 800 V DC for 1 minute.

Typical Humidity test:

Conditions - 50° C, 93% RH, at 250 V AC for 1000 hours.

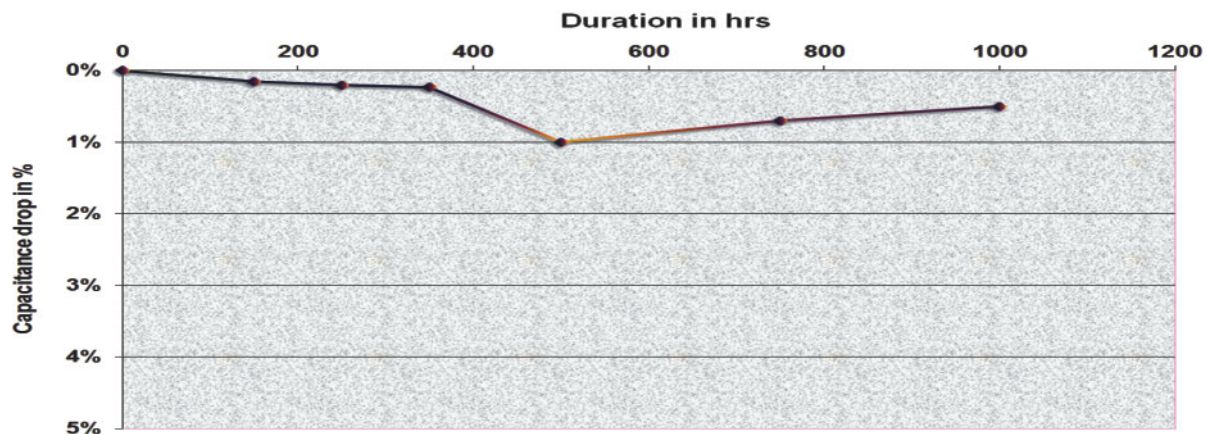
The capacitor performance is more reliable and the capacitance drop is less than 5%.

Accelerated life test conditions: 85° C, 1.25xU, and for 1000 hours.

The capacitor performance is more reliable and the capacitance drop is less than 8%.

Expected service life at 25° C, 310 V AC at RH < 60% >100000 hours and even > 60% RH environmental conditions but not more than 500 hours continuously.

Hence the design is well suited for high humid environmental applications.



Summary

Design Name	Across the line X2	In series with main	Humidity	Temperature	Max. operating temperature	Capacitance drop
High stability	✗	✓	93% RH	50°C for 1000 hours	70° C for very short duration of 168 hours with humidity	5%

Metallised Polypropylene Film Capacitors for Lighting Applications

Metallised Polypropylene Capacitors for Low Frequency AC Applications

Characteristics: Metallised polypropylene film, non-inductive winding coated with flame retardant grade epoxy resin, 275 / 305 V AC, 50 / 60 Hz, 10 mm pitch.

Range:

Capacitance in µF	Voltage V AC
0.10	275 / 305
0.15	275 / 305
0.18	275 / 305
0.22	275 / 305

The design performs well in low frequency AC applications like CFL / ballast and LED applications.

Rated temperature: 85° C.

Maximum Operating Temperature: 100° C.

Between 85° C and 100° C, a derating of 1.25% per °C has to be applied on the rated voltage.

Voltage Proof: 1200 V DC for 2 seconds.

Damp Heat: 40° C / 93%RH / 56 days, no voltage.

The capacitor performance is more reliable and the capacitance drop is less than 5%.

Accelerated Life Test Conditions: 85° C, 1.25xU, and for 1000 hours.

The capacitor performance is more reliable and the capacitance drop is less than 8%.

Power Factor Correction (PFC) Film Capacitors

Power Factor Correction Capacitors in 10 mm Pitch

Power factor (PF) is defined as the ratio of the real power (P) to apparent power (S) and is a dimensionless number between 0 and 1. Real power (watts) produces real work, i.e., is the capacity of the circuit for performing work in a particular time. The apparent power is considered the total power that the power company supplies.

Essentially, power factor is a measurement of how effectively electrical power is being used. The higher the power factor, the more effectively electrical power is being used. The efficiency of power generation, transmission or conversion is improved when operated at near unity power-factor. Power Factor Correction (PFC) is the practice of raising the power factor of an inductive circuit by inserting capacitance.

Power factor correction capacitors must be able to withstand high voltage transients and power line variations without breakdown. The best selection for this application is **metallised polypropylene type power factor correction capacitor**. This has the advantage of self healing and low self heating of the capacitors.

Capacitance range and application

Deki is introducing PFC capacitors of values from 0.22 μF to 0.68 μF in miniature size with 10mm pitch. These capacitors are designed for a rated voltage of 400 V DC and are best suited to many applications like lighting, transmission lines, discharge lamps, electric motors, transformers, soldering equipment, induction furnaces.

Features

- Self healing
- ROHS compliance
- Miniature size

The PFC capacitors in a reactive circuit

- Reduce heat loss of transformers and distribution equipment
- Prolong the life of distribution equipment
- Stabilizes voltage levels
- Increase system performance
- Reduces power bills

Technical data

Dielectric material	MPP (Metallised polypropylene)
Capacitance @ 1 kHz	0.22 μF to 0.68 μF
Rated Voltage (V_R)	400 V DC
Pitch	10 mm
Voltage proof	1.6 V_R for 2 sec
Dissipation factor tan δ value	at f =1 kHz : 0.001 at f =100 khz : 0.01
Insulation resistance measured at 100 V DC for 60 s	> 100000 M Ω for C \leq 0.33 μF > 30000 s for C > 0.33 μF
Temperature operating range	-40°C TO 85°C
Construction	Low inductive cell of metallised polypropylene film coated with flame retardant epoxy resin
Applicable specification IEC 60384-16.	
Temperature derating	For temperature between +85°C and 100°C, a decreasing factor of 1.25% per °C on the rated voltage V_R has to be applied.
Endurance test	Loaded at 1.25 times of rated voltage at 85°C or 1.25 times of category voltage at 100°C for 1000 hours. Category voltage is 80 % of rated voltage.
After the test	
$\Delta c/c$	\leq 5% of initial value
Change in Tan δ	\leq 0.004
Insulation resistance	\geq 50% of the value mentioned in IR chart

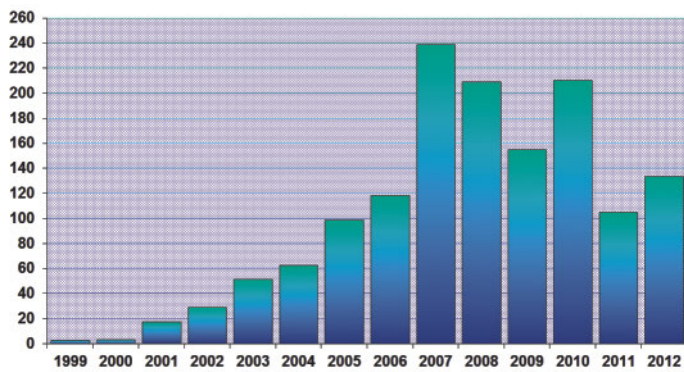


Suggestion Scheme

The suggestion scheme in Deki has been growing continuously, though we witnessed a drop in 2011 owing to recruitments during 2010. The success of the scheme lies in its simplicity. An employee fills up a suggestion form mentioning:

- a. the current process
- b. the proposed process
- c. the savings/benefits to accrue from the proposed process

The is given to the section-in-charge who puts his remarks and hands it over to the suggestions committee. The committee, that meets every week, deliberates on all the suggestions and decides those that are acceptable. All accepted suggestions are rewarded each week.



The suggestion scheme at Deki sees a lot of participation

Deki is now a 1.2 billion pieces per annum company

As part of its growth strategy Deki has invested Rs 100 million in plant and new machinery that has increased the production capacity to 1.2 billion pieces per annum.

Here are some of the new machines that help us achieve this landmark.



Powder coating machine



Welding machine



Winding machine

Valuemagics - a new roadmap to global markets

Mr Vinod Sharma, Managing Director, Deki Electronics Ltd, has co-authored this book with Mr Hans Verhulst of CBI, an agency of the government of the Netherlands that helps in developing exports from developing countries.

Value Magics is an invaluable exporting aid, particularly for small to medium sized manufacturers, growers and service providers in emerging economies. The book is a step-by-step manual to develop business plans, reversing the "sell what you make" attitude to a much more effective "make what sells" approach according to Mr Sharma. The book uses a simple model, "The Magic Pallet", to explain the costs, value, benefits and sacrifices in the value chain while a practical tool called "SWAT" - an analysis of "Sources, Winners, Alliances and Trends"- explains how to develop robust market-entry strategies. Mr Verhulst says, "We've applied the methodology described in this book for many years in the field and obtained excellent results."

To request a copy of the book please send an email to valuemagics@cedis.nl.

