

CHARGE

February 2009

A Technical News Journal from Deki Electronics Ltd

Editor's Desk

Dear Reader,

Deki's R&D has been ensuring that the average turnover from new products (life <3 years) is in excess of 30% year after year. In the August 2008 issue we talked in detail about the PES (Polyester Extra Strength) capacitor. This new product gave our customers a capacitor which is either of the same size or smaller than the existing Inductive PET series but with a higher minimum breakdown voltage. This capacitor has been very well received in the market.

This issue is devoted to another innovative product from Deki. This product combines the ruggedness of the film/foil inductive capacitor to withstand high voltage spikes and the self-healing properties of the metallised capacitor. This unique design - called the PSH/TSH series - has been patented by Deki. The PSH/TSH series is an ideal, cost-effective substitute for dip or box type MPP/MPP 1250V/1600V/2000V capacitors used in higher wattage CFLs (>24 watts) and HF ballasts.

On the social responsibility front, Deki has been working with ASK (Association for Stimulating Knowhow) since 2007 to introduce the EICC standards of CSR. A detailed report on the work done is now available.

In exhibition news, Deki was at Electronica, Munich in November 2008 and will be participating in Lighting South Asia, Mumbai in February 2009.

Please keep your comments and suggestions coming in as always.

Anil Bali

Deki at Electronica, Munich



A view of the Deki stall.

Deki has been attending Electronica, Munich since 2002. Held every two years, it is the world's largest electronics exhibition where Deki was present as part of CBI, the Netherlands from 2002 to 2006, moving to ESC in 2008.

Our three objectives at Electronica are:

- 1) Meeting existing customers
- 2) Meeting new customers, targeted and walk ins
- 3) Keeping in touch with international competition.

We met our expectations in all three areas. We made contact with thirteen new customers and advanced stage of sample approval is on.

First Supply to Philips, Terneuzen

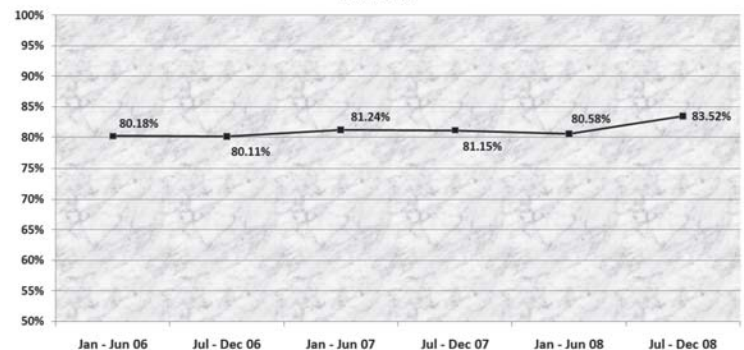
Deki made the first supply of starter capacitors to Philips, Terneuzen in the Netherlands in the month of January 2009. The Philips team visited Deki in April 2008 and after eight months of interaction the first lot of 1 million pieces was despatched in January 2009. Despatches of a container load of capacitors will start from May this year.

External Customer Satisfaction Survey

As you know very well by now, Deki conducts an external customer satisfaction survey every six months. The results of the last survey for the period July-December 2008 indicated another term of a consistently improving trend. In fact, we achieved the highest ever score of 83.52% with price, delivery and technical support being the main areas of improvement.

Regular interaction with the R&D departments of our customers and regular technical seminars helped in increasing the score in the area of technical support. Focus on reduction in process cycle time and daily monitoring of the production CLIP helped to improve our score in delivery. We would now like to maintain this level for the next six months by continuing these activities.

External Customer Satisfaction
Total Score

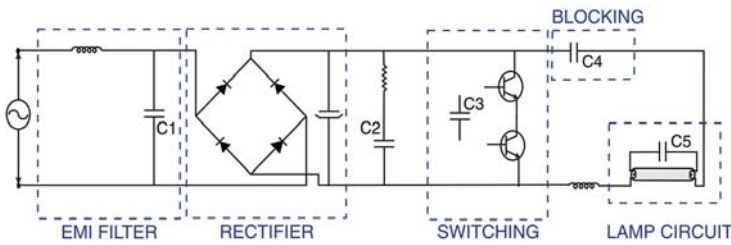


LAUNCHING THE BREAKTHROUGH PSH CAPACITOR
Lighting South Asia
 Stall D09, Bombay Exhibition Centre, Mumbai
 February 20 - 23, 2009
 JOIN US TO FIND OUT MORE

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Requirement for lamp circuit capacitor in high wattage CFL

A CFL circuit can be divided into five parts: filter, rectifier, switching section, blocking and lamp circuit. The critical section of a CFL is the



lamp circuit since it has to withstand high voltage spikes with high frequency during the ignition phase of the CFL.

Polyester Inductive capacitors are generally used in low wattage CFL lamp circuits where the wattage is less than 24 watts. For high wattage CFL lamp circuits MPP/MPP capacitors are generally used as inductive capacitors cannot be used due to inherent design issues.

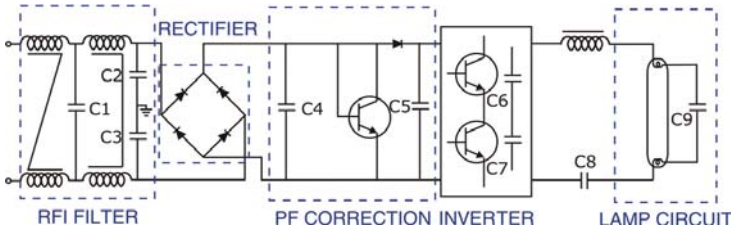
PET inductive capacitors have a film foil construction with aluminium foil as electrode and polyester (PET) film as dielectric. While the aluminum foil electrode thickness is 5-6 microns the dielectric film thickness depends upon the voltage rating of the capacitor. In this construction type, both the aluminium foils are parallel to each other and are separated by a dielectric. There is a probability of short circuit when high voltage spikes occur owing to the possibility of weak points in the dielectric.

At Deki, we have been successful in developing a unique capacitor that not only withstands the high voltage spike at ignition but also has self healing properties.

This self-healing inductive capacitor is an ideal choice for high wattage CFLs.

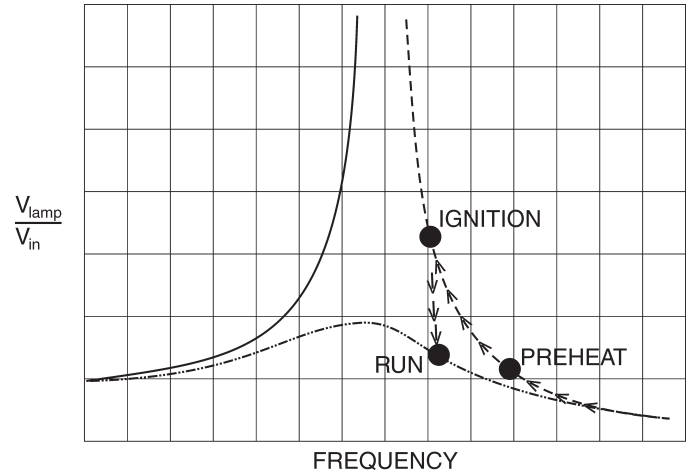
Requirement for lamp circuit capacitor for HF ballast

An HF ballast has five sections: filter, rectifier, power factor correction, inverter and lamp circuit. The critical section in this is the lamp circuit because it has to withstand a high voltage spike and high current during the ignition phase.



Before the lamp is ignited, the lamp resistance is very high so that it can be treated as open circuit. The gain curve of the lamp voltage over V_{in} as a function of the switching frequency is shown in figure (right top). The lamp operating point goes from preheat to ignition which means that the switching frequency is decreasing and the lamp

voltage is increasing. At the point of ignition the lamp resistance drops quickly. The operation point then moves from ignition to run, the steady state operation point.



The critical portions in the cycle are the preheating and ignition phases because of high current and high frequency in preheating and high voltage spikes in ignition.

Most HF ballasts use MPP/MPP or MMPP (double side metallised) capacitors. The unique inductive self-healing polypropylene design from Deki is an ideal replacement with the following advantages:

- High reliability
- Self-healing
- Smaller pitch (5 and 7.5 mm)
- Improved AC performance compared to inductive type
- Cost effective series vs. MPP/MPP capacitors.

INDUCTIVE SELF HEALING POLYPRPOYLENE CAPACITOR DPSH CAPACITORS

Construction: Film/foil wound cell with internal series construction aluminum foil as electrode and metallised polypropylene (MPP) film as dielectric, coated with epoxy resin.

Capacitance range: 0.001 μ F to 0.01 μ F

Rated voltages: 1250 VDC / 500 VAC, 1600VDC / 500 VAC, 2000 VDC / 500 VAC

Capacitance tolerances: \pm 5%, \pm 10%

Applicable specification: IEC 60384-13

Operating temperature range: -40°C to +100°C

Pitch: 5mm, 7.5mm

Test voltage: 2 times U_r , 2 sec

Voltage derating: For temperatures 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 conditions (DC)

Temperature: +85°C±2°C

Test duration: 1000 h

Voltage applied: 1.5 x V_R (DC)

Performance

Capacitance change ($\Delta C/C$): ≤ 3%

DF change ($\Delta tg\delta$): 1.4 times value measured before the test

Insulation resistance: ≥ 50% of initial limit.

RoHS compliant

INDUCTIVE SELF HEALING POLYESTER CAPACITOR DTSH CAPACITORS

Construction: Film/foil wound cell with internal series construction aluminum foil as electrode and metallised polyester (MPET) film as dielectric, coated with epoxy resin.

Capacitance range: 0.001 µF to 0.01 µF

Rated voltages: 1250 VDC / 500 VAC, 1600VDC / 500 VAC, 2000 VDC / 500 VAC

Capacitance tolerances: ±5%, ±10%

Applicable specification: IEC 60384-11

Operating temperature range: -40°C to +125°C

Pitch: 5mm,7.5mm

Test voltage: 2 times U_r , 2 sec

Voltage derating: For temperatures between +85°C and +125°C a decreasing factor of 1.25% per °C on the rated voltage V_R has to be applied.

Endurance:

Test conditions (DC)

Temperature: +85°C±2°C

Test duration: 1000 h

Voltage applied: 1.5 x V_R (DC)

Performance

Capacitance change ($\Delta C/C$): ≤ 5%

DF change ($\Delta tg\delta$): ≤ 0.01 or 1.2 times value measured before the test

Insulation resistance: ≥ 50% of initial limit.

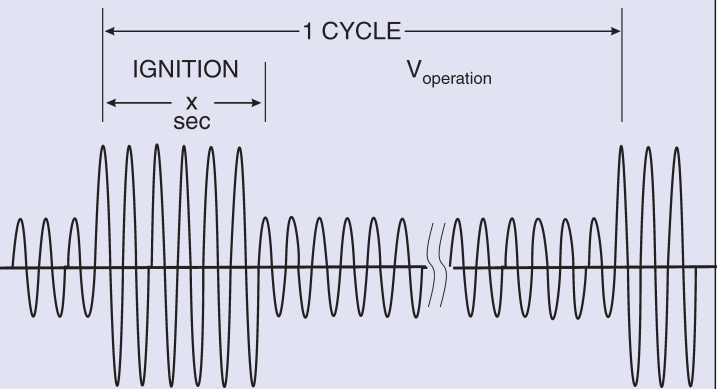
RoHS compliant

To confirm usage of film capacitors at high frequency and high current applications there are two alternatives:

1. test under actual conditions, or alternatively,
2. test in shorter time with high frequency and high current source.

Deki conducts such application life tests with its own custom built, high frequency, high current power source to ensure zero defect film capacitors for customers.

DEKI HIGH FREQUENCY HIGH VOLTAGE SIMULATOR



- High frequency with high voltage (200 kHz and 1000 V_{rms})
- High current

In this simulator we can vary the frequency from 20 kHz to 200kHz and the voltage from 50 volts to 1000volts. Depending upon the capacitance we can load 1 to 10 pieces simultaneously.

For simulating the actual working in CFL and HF ballasts our testing has two distinct parts. The first is ignition and the second is steady state operation. The capacitor is subjected to 10,000 cycles and checked thereafter.

Deki's DPSH and DTSH capacitors have successfully gone well past 10,000 cycles which is the standard.



EICC at Deki

Association For Stimulating Know How (ASK), a national level non-profit organisation established in 1995, has been working towards improving workplace CSR standards in the ICT Electronics Sector in India for past few years. Mr Vinod Sharma, MD, Deki Electronics and ex-President of ELCINA, the industry association was instrumental in organising and participated in the joint seminar on EICC standards by ELCINA and ASK for ELCINA Gujarat members.

ASK's association with Deki Electronics began in 2007 to facilitate a capacity building process aimed towards bringing positive change at the workplace. The Electronics Industry Code of Conduct (EICC) standards is an effort by the global electronics industry for improving workplace standards in the global supply chains worldwide (www.eicc.com).



Training Session with Top Management representatives at Deki Electronics in progress with Ms Monica Ramesh, ASK

At Deki the ASK team ran training sessions for 53 managers and executives and 344 workers to create an awareness towards the global CSR developments in the electronics manufacturing industry. In focus was the evolution of Electronics Industry Code of Conduct (EICC) and its coverage.

A SWOT analysis was undertaken, both by the workers and the management team, to assess where Deki was in terms of work practices in relation to EICC standards. This led to the development of a concrete action plan to improve Deki's workplace standards.

This entire process could be organised at Deki because of openness of the management team, their perspective and philosophy of CSR. Mr Vinod Sharma, the Managing Director is a passionate and dynamic leader. According to him, *“Corporate Social Responsibility is all about the philosophy of doing business; do you want to make money by taking away money from the poor who deserve it? Do you want to conduct your business in isolation without acknowledging and understanding the perspective of your key stakeholders? Are we as businesses incompetent to make this much money so as to pay our workforce their due wages as per the legal norms”*. These are some

questions he raised during the management training sessions conducted by ASK.

Deki's Perspective towards CSR

CSR for Deki is “an activity that establishes relationships of trust with all stakeholders; in order for it to operate as a socially reliable company”. This reflects the fact that Deki's business activities are largely attributable to its stakeholders, including customers, shareholders, investors, employees, suppliers, government and local communities. Therefore, Deki is able to enhance its corporate value not only by responding to their expectations but also working towards exceeding them.

The concrete benefits for CSR have been the following:

- Healthier business relationships
- Cultural development and cordial employee relationships
- Enhanced professional image
- Increased productivity
- Wastage reduction

This philosophy and perspective has been demonstrated by Deki management by engaging with ASK on promoting CSR standards. The findings of the assessment opened doors to a series of capacity building trainings for the management, executives and workers.

The main focus of these trainings was to understand the expectations of the global industry towards improving workplace standards and to assess the areas of strength and areas of improvements for Deki Electronics.

During this process, special emphasis was laid on listening to and respecting the workers' perspectives regarding improvements they would like to see in their workplace. This dialogue has led to concrete action plans both for management and workers to take joint ownership of improving workplace standards at Deki.



Workers from Deki Electronics engaged in a small group discussions to analyze the present strengths and areas of improvement against EICC standards