

# CHARGE

August 2008

A Technical News Journal from Deki Electronics Ltd

## Editor's Desk

Dear Reader,

Deki's R&D department has maintained a steady stream of new products and their contribution to the company's turnover has been tracked for the past five years. For us, a new product ceases to be new after three years of being introduced. It is, therefore, gratifying to note that the average turnover from new products has been in excess of 30% year after year.

This edition of Charge is devoted to our latest product: the newly developed PES series. The Polyester Extra Strength series gives our customers a capacitor which is of the same size, if not smaller, than the existing Inductive PET series but with a higher minimum breakdown voltage. This breakthrough has been achieved by the application of a unique 6-film design.

We are also delighted to inform all of you that Deki has initiated a dramatic change in the field of HR. Working with Reach Potential, our advisors, the entire HR function has been revamped, making it more professional and integrating it into the business plan. A detailed note on the HR movement in Deki is available in this issue.

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

Anil Bali

## Employee Satisfaction Survey

Deki's employee satisfaction survey every six months has employees answering a set of fifteen questions pertaining to:

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

A consolidated report then compares current results with those of the previous survey. The report and the action points for improvement are discussed with all the employees in an *Open House* by our Managing Director, Mr Vinod Sharma.

The February 2008 survey showed a slight reduction of 1% over the earlier survey with the main areas of loss being:

- a) Work instructions and standard specifications
- b) Growth opportunity in Deki
- c) Member of Deki family

The main areas of gain were:

- i) Training
- ii) Salary package
- iii) Individual potential utilisation.

As an area of gain, employees acknowledge that individual potential is being utilised. This thinking approach will ensure that employees grow within Deki and become useful members of the Deki family.

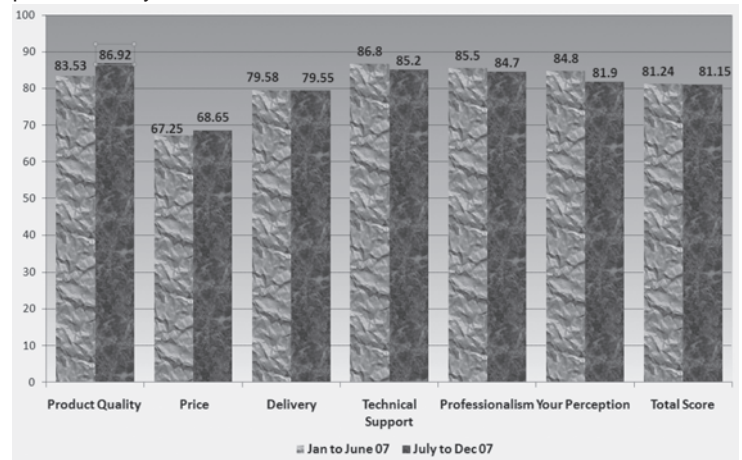
However, more training is required to make employees fully understand work instructions and standard specifications

## External Customer Satisfaction Survey

Deki's six-monthly external customer satisfaction survey works as a reality mirror for us. The results of the July-December 2007 survey maintained the consistently improving trend with an enhancement in the area of product quality.

Our score could have been even better but for "your perception" of Deki where we lost 3 percentage points.

The Deki marketing team is committed to taking this score in excess of 85% in the next survey by improving customer perception of Deki as a solution provider. They plan to do this by organising seminars and regular interaction with customers' R&D. The focus is also on improving delivery performance and the PPC team is monitoring the performance with our top ten customers. We are confident of meeting our promised delivery dates with this close follow up and reduction in production cycle time .



## The Theory of Constraints at Deki

Deki prides itself on being a learning organisation with more than 3% of employee time being spent on training and learning new concepts.

One new concept that Deki is implementing is the *Theory of Constraints* originated by Dr Eliyahu M Goldratt. According to this theory every organisation has - at any given point in time - at least one constraint which limits the system's performance relative to its goal. These constraints can be internal or external. In order to manage the performance of the system, the constraint must be identified and managed correctly according to the Five Focusing Steps.

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## DEKI PES (Polyester Extra Strength ) SERIES

A capacitor is two conducting surfaces separated by an insulating (dielectric) material. A capacitor stores electrical energy, blocks the flow of direct current and permits the flow of alternating or pulsating current to a degree dependent on the capacitance and the frequency. The conducting surface may be aluminium foil, in case of film foil type, or metallised film, in case of metallised capacitor. Dielectric film thickness is derived from voltage rating of the capacitor.

Polyester extra strength capacitor (PES) is a film foil inductive type capacitor. It has aluminium foil as a conducting surface and plain polyester film as a dielectric and these elements are wound to form a capacitor. The breakdown voltage (BDV) of the capacitor is directly proportional to the dielectric film thickness. That means that as the dielectric film thickness increases, the breakdown voltage increases as well. Hence, the conventional way to increase the breakdown voltage is to increase the film thickness. Deki's R&D department has, however, developed a capacitor with smaller/same dimension but with a higher minimum break down voltage. This has been achieved with a unique six film design developed in-house.

The minimum break down voltage of PES and normal film foil capacitor is compared for three different values: 0.022/400V, 0.033/400V and 0.047/400V. The graphs are plotted below. You will notice that the minimum BDV of PES capacitor is approx. 500V more than the minimum BDV for a normal film foil capacitor. As per product specification a 400V capacitor must have a minimum BDV of 800V. As against that, Deki's normal design has a minimum BDV of 2.8kV to 3.3kV and the newly developed PES capacitor has a minimum BDV of 3.3kV to 3.8kV.

More importantly this increase has been achieved by using a capacitor which is slightly lesser in size compared to the normal as can be seen below.

	Normal 0.022/400v/10%	PES 0.022/400v/10%
Height (mm), max	14.0	14.0
Thickness (mm), max	5.5	4.5
Width (mm), max	9.5	8.0
Pitch (mm)	7.0	5.5

	Normal 0.033/400v/10%	PES 0.033/400v/10%
Height (mm), max	14.0	13.0
Thickness (mm), max	6.2	5.2
Width (mm), max	10.0	9.2
Pitch (mm)	7.5	7.5

	Normal 0.047/400v/10%	PES 0.047/400v/10%
Height (mm), max	14.0	14.0
Thickness (mm), max	6.5	6.5
Width (mm), max	12.0	12.0
Pitch (mm)	7.5	7.5

In conclusion Deki's PES capacitors offer a higher minimum Break down voltage and with a lesser variation than normal PET capacitors. More importantly this has been achieved using the same/lesser thickness than normal capacitors. All this comes at a marginal increase of 10% in selling price.

### Polyester extra strength (PES) capacitor range

**Capacitance range:** 0.001 µfd to 0.1 µfd

**Voltage range:** 300 vdc to 1250 vdc

#### Application:

- Blocking
- Bypassing
- Filtering
- Coupling
- Decoupling
- CFL application

**Applicable IEC standard:** IEC 60384-11

**Voltage proof:** 2 times rated voltage for 2 sec

**Life testing condition:** Loaded at 1.5 times of rated voltage at 85°C or 1.5 times of category voltage at 100°C for for 1000 hours. Category voltage is 85% of rated voltage.

#### After life test:

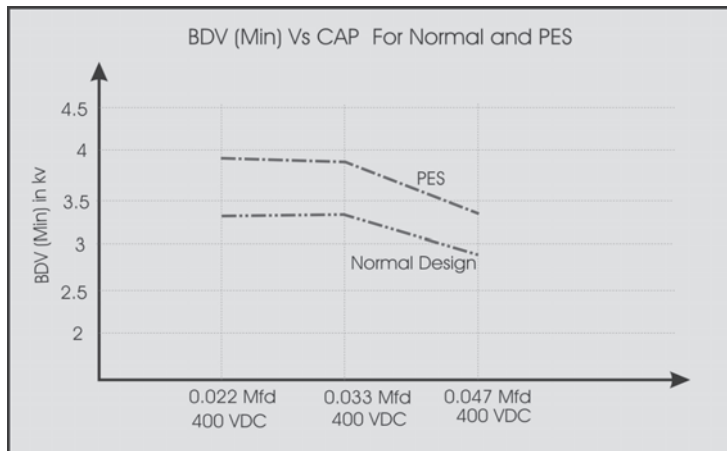
$\Delta C / C = 5 \%$  of initial value

**Change in  $\tan \delta$**  = 0.01 or 1.2 times the value measured before the test, whichever is higher

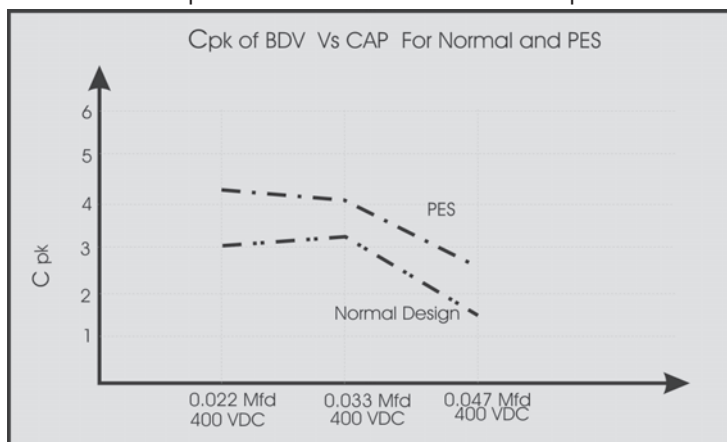
**Insulation resistance** = 50 % of the value mentioned in IR chart.

**Insulation Resistance:** Minimum insulation resistance  $R_{is}$  (or) time constant  $T = C_R \times R_{is}$  at 25°C, relative humidity  $\leq 70\%$

VR ( Rated voltage)	CR = 0.33 µf	CR > 0.33 µf
$\geq 250V$ DC	100 GΩ	10000s



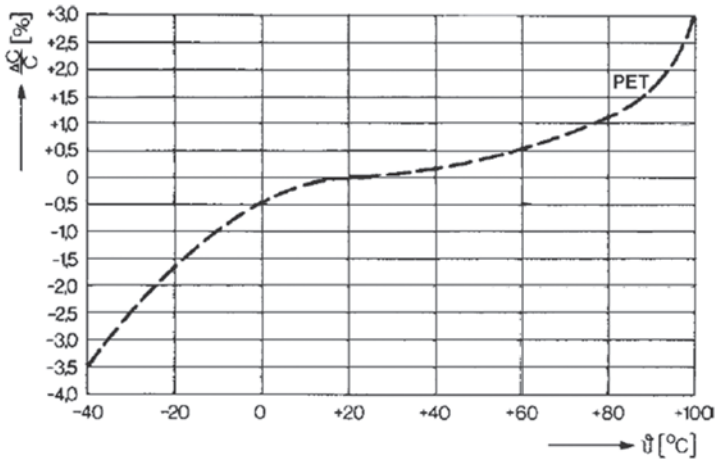
The graph below shows the variation in the BDV for the three values for both the designs. As you can see, the Cpk of PES capacitor is much better than the normal capacitor for all three values. This means that the variation in BDV for PES capacitors is much less than in normal capacitors.



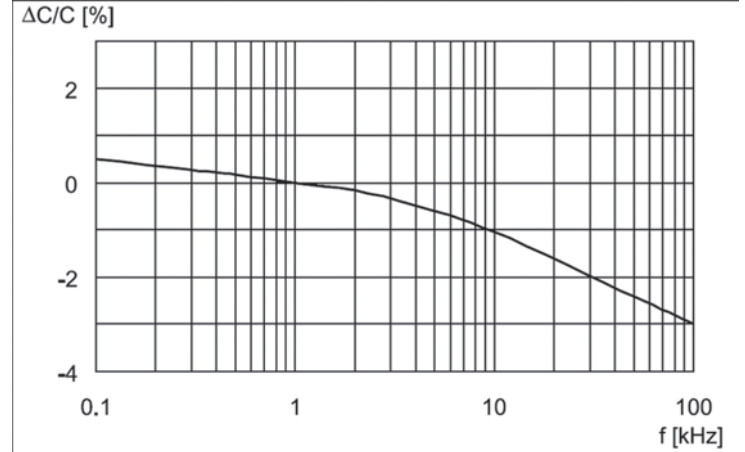
## Temperature characteristics of PES Capacitors

Variation of capacitance as a function of temperature, linear or non linear, cannot be expressed with precision and certainty. The temperature characteristics of capacitance is the maximum reversible variation of capacitance produced over a given temperature range with in the category temperature range. It is normally expressed as a percentage of capacitance related to a reference temperature of 20° C.

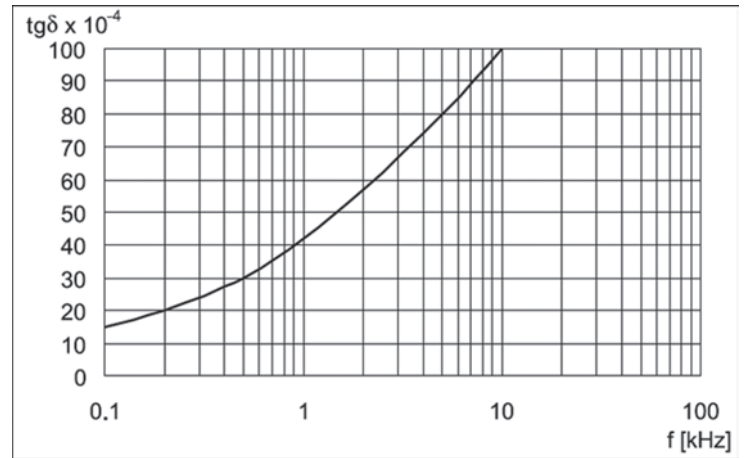
### Capacitance Change $\Delta C/C$ versus Temperature $\theta$



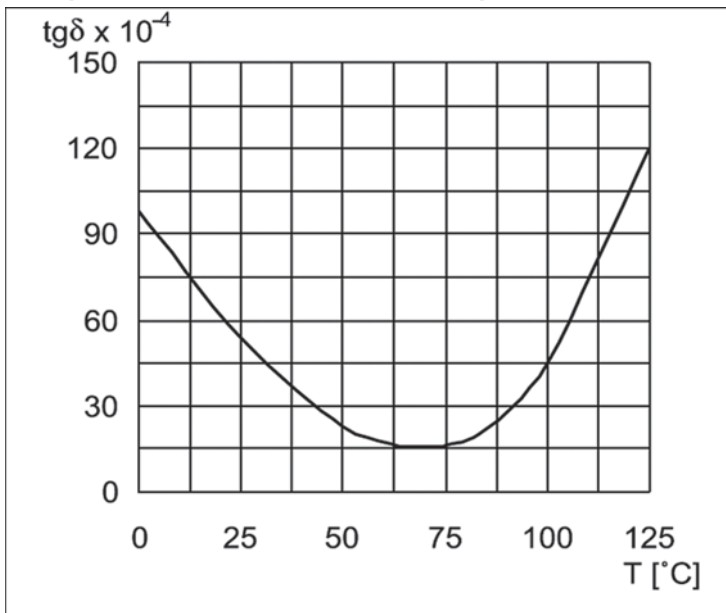
### Capacitance versus Frequency



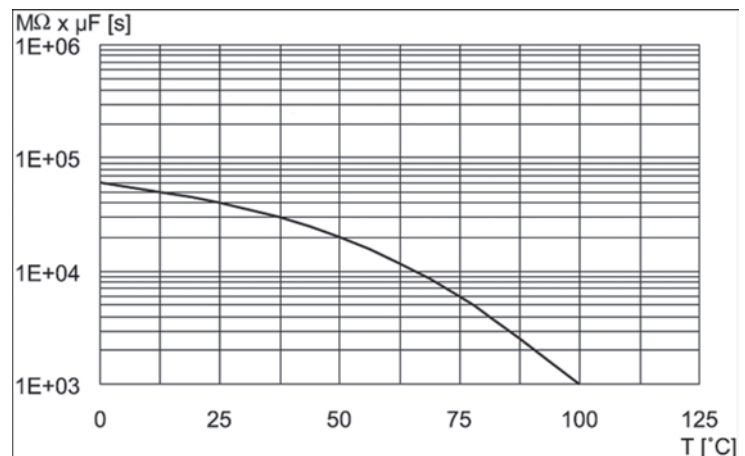
### Dissipation Factor versus Frequency



### Dissipation Factor Variation with Temperature



### Time constant versus Temperature





## The Theory of Constraints at Deki *(contd. from front page)*

Over time the constraint may change (e.g., because the previous constraint was managed successfully, or because of a changing environment) and the analysis starts anew.

The Five Focusing Steps are:

- 1) Identify the bottleneck
- 2) Exploit the bottleneck
- 3) Subordinate everything else to the bottleneck
- 4) Elevate the bottleneck
- 5) Go back to 1)

At Deki we have begun using this theory and have met with some success. All HODs are aware of bottlenecks in production. The Production Department tries to exploit these bottlenecks with trained manpower and ensuring optimum machine run time. Maintenance ensures that bottleneck machines get priority in their system.

Overall Equipment Efficiency of bottleneck machines is discussed every day to see how further improvements can be made.

In addition, a daily HOD meeting reviews the throughput (contribution margin) of the previous day. The contribution margin from sales and all three production lines are also reviewed to see how the contribution margin can be maximised.

## Deki at Light India International

Deki participated in Light India International at Pragati Maidan, New Delhi from February 22 to 25, 2008. Deki was the only film capacitor company participating in this lighting exhibition. The reason for our participation was to be in the midst of our customers and showcase our strong focus on lighting applications - CFL & HF Ballast.



Deki had a successful four days with the theme of *Ring the Bell if you are Happy with Deki Quality* attracting a lot of visitors. We witnessed a lot of rings from our customers who wanted to inform the world about their satisfaction with Deki quality.

## HR @ Deki Electronics

### Powered by HR Partners Reach Potential

During the past 13 months, Deki Electronics has executed various systematic, pre-defined HR interventions with the aim of creating a 'Learning Organisation' that is performance-driven and that addresses organisational needs of motivating people to deliver to the best of their abilities.

The genesis was the need realised by Deki that all employees need to share a common vision and understanding of the organisation's future. It was also an imperative that the HR systems and policies grow along with the organisation, leading to growth and development of the people. Deki also wanted to ensure people capability development in line with the higher responsibilities entailed by Deki's growth.

The mandate for Reach Potential ([www.reachpotential.in](http://www.reachpotential.in)), keeping in mind the above context, was to:

- Conduct an HR diagnostic study in Deki Electronics
- Recommend Action Plan (Short, Medium and Long term) to address the gaps in the HR systems and policies

Deki, at this stage, is in the process of revamping existing and introducing new HR systems, based on the recommendations of the HR diagnostic report and the Action Plans. There have already been some discernible landmark shifts in the HR practices as also in the mindset of the employees. The most powerful change has been the transfer of ownership for people management from the top leadership and HR department to all the levels in the organisation (Line Managers, Supervisors, etc). All the people managers are now empowered and skilled in taking ownership for their teams, in assessing their performance, developing their skills and aligning their goals with the organisational objectives.

Another key intervention has been the creation of Role Profiles, which has resulted in not only role clarity for the individual role-holder, but also clarity for the organisation in terms of the role expectations.

The changes in the Performance Management System have led to more objectivity in performance assessment through clarity on individual Key Result Areas, better differentiation between performers and non-performers. This has further resulted in a better linkage with other key systems like reward and recognition and career management, ensuring that performers are rewarded with better career opportunities as well as incentives and bonus. The workshop on Feedback Giving Skills also facilitated the process of creating a more open culture of giving feedback.

A more robust Training needs analysis process has been institutionalised, with a keen focus on creating Trainers from within the organisation as well as providing real-time and required trainings to the target population.

Apart from the targets against the Key Result Areas, Deki is also focusing on the following Key Skills across the organisation. The process of cascading these competencies has begun and going forward, each and every employee will need to demonstrate these skills and competencies based on the nature of their role:

- I. Creative Problem Solving
- II. Client Focus
- III. Taking Ownership
- IV. Teamwork & Collaboration

All of the above interventions as well as many more in the pipeline are all focused and aligned towards the transformation of Deki into an organisation that realises the power of its people and wants to give its employees opportunities to realise their potential and grow within the organisation.