

Fakulti: <b>FAKULTI KEJURUTERAAN ELEKTRIK</b>	
Nama Matapelajaran: Makmal Tahun 4	Semakan : 1
Kod Matapelajaran : SEE 4722	Tarikh Keluaran : 2007
	Pindaan Terakhir : 2007
	No. Prosedur : <b>PK-UTM-FKE-(0)-10</b>



## SEE 4722

FAKULTI KEJURUTERAAN ELEKTRIK  
UNIVERSITI TEKNOLOGI MALAYSIA  
KAMPUS SKUDAI  
JOHOR

### INSTITUT VOLTAN DAN ARUS TINGGI (IVAT) STUDENT PACK (Experiment 13)

#### Surface Discharge Characteristics of Different Kind of Polymeric Materials under AC Voltage

Disediakan oleh :	Disahkan oleh : Ketua Jabatan
Nama : Dr. Yanuar Z. Arief	Nama :
Tandatangan :	Tandatangan :
Cop :	Cop :
Tarikh : April 2009	Tarikh :

## 1. LIST OF COMPONENTS AVAILABLE

### a) High Voltage Construction Kits and Measuring Equipment

- High voltage test transformer
- Electrode arrangement
- High pass filter
- Oscilloscope/Picoscope
- Measuring capacitor
- Connectors and Accessories
- Protection system
- Measuring system

### b) Polymeric material samples, namely high density polyethylene (HDPE), polypropylene (PP), and polyvinyl chloride (PVC)

### c) Digital Microscope for physical observation of polymeric materials.

## 2. PROBLEM-SOLVING TIME-LINE

Activities	Week 1	Week 2	Week 3	Week 4
1) Understanding/Identify/Brainstorming				
2) Design/Simulation/Experiments				
3) Hardware Development/Testing				
4) Measurements/Data Analysis				
5) Presentation/Report Writing				

## 3. REPORT WRITING

- a) Beside the general guide specified by the Laboratory Coordinator, your report for this laboratory must also include;

- Results all of the tests.
- Photographs of the system set-up.
- Photographs of your group members during hands-on session.
- The group shall submit a write-up on the topic of *Electrical Insulation in Power Systems and Partial Discharge Phenomena* (5 pages) to the facilitator on the **second week** of the laboratory.
- In the report, you have to consider only the characteristics of surface discharge characteristics of polymeric materials on open-air arrangement in your analysis/discussion.

#### 4. Bibliography

- i) Dieter Koenig, Y. Narayana Rao, “Partial Discharge in Electrical in Power Apparatuses”, VDE –Verlag GmBh, Berlin, 1993.
- ii) W. Tillar Shugg, “Handbook of Electrical and Electronic Insulating Materials”, 2<sup>nd</sup> Ed., IEEE Press, 1995.
- iii) M.S. Naidu and V. Kamaraju (2004). *High Voltage Engineering*. Mc. Graw Hill.
- iv) E. Kuffel and W.S. Zaengl. *High Voltage Engineering, Fundamentals*. Pergamon Press.
- v) Useful information related to high voltage engineering is available at <http://www.nikhef.nl/~enrichn/highvolt/notes.html>
- vi) More information on Insulator News and Market Report can be obtained at <http://www.inmr.com/>