



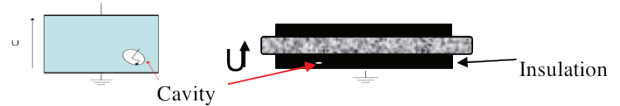
DID YOU KNOW? PARTIAL DISCHARGE FOR HIGH POWER THICK FILM RESISTORS

Partial Discharge Definition

- A partial discharge is an electrical discharge or spark that bridges a small portion of the insulation between two conducting electrodes
- Partial discharge activity can occur at any point in the insulation system where the electric field strength exceeds the breakdown strength of that portion of the insulating material

Root Causes

- Voids within solid insulation
- Contamination by particles on the surface of insulating material
- Irregularities (e.g. sharp points) on the surface of conductors
- Discharges around an electrode in gas (corona activity)
- Mechanical failure or damage to insulation materials (adhesion problems, for example)
- Partial discharge activity is also affected by environmental factors, including temperature and humidity

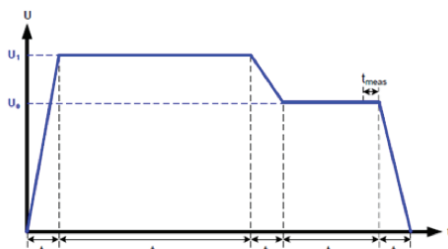


Partial Discharge Effects

- Partial discharge activity causes progressive deterioration of components: damage ALWAYS increases over time
- The process of deterioration can propagate and develop until the insulation is unable to withstand the electrical stress, leading to flashover
- Noise (ultrasonic) and ozone generation

How Vishay Sfernice MCB Manages to Produce and Control “Partial Discharge Free” Components

- By a:
 - » Selective choice of raw materials
 - » Predictive design (FEM calculation)
 - » Process control in place
 - » 100 % final testing on components



Time:

- $t_r = 10$ s: voltage rise time
- $t_1 = 1$ min: steady state time 1
- $t_r = 10$ s: voltage fall time
- $t_2 = 30$ s: steady state time 2
- $t_{meas} = 5$ s: time for partial discharge measuring

- This allows Vishay Sfernice to deliver partial discharge free LPS, RCEC, and RCMC resistors avoiding their outage-cause effects