

Energy Storage Capacitors



Advantages

- World Class Raw Materials
- Mfgd in State of art infrastructure
- Low Loss
- Highly Reliable
- Long Life Performance
- Environmental Friendly

For Research & Defense application



An ISO 9001 : 2008 Certified Company

Magnewin
Enhancing Power

Energy Storage Capacitors

Scope

D C capacitors up to 150 Kv DC, energy up to 20 kilojoules, and inductance as low as 40 nH manufactured using biaxially oriented hazy propylene film as dielectric, aluminum foil as electrode and impregnated with Non-PCB as impregnant. These capacitors are designed for use in Energy Storage and discharge applications.

- with dead casing, open terminal (2 bushings).
- with live casing, open terminal (1 bushing).

Standards

IEC 61071-2007

BIS 13666:1993 (Indian Std.) Energy Storage Capacitors.

Capacitors in accordance with other standards / against specifications can be manufactured upon request.

Categories

Energy Storage capacitors are classified into different categories depending on maximum peak current, repetition rate, working temperature, storage temperature, or inductance values.

Classification Based on Max. Peak Current

- 1.Max. Peak Current...25 kA.
- 2.Max. Peak Current...50 kA.
- 3.Max. Peak Current...200 kA.
- 4.Max. Peak Current...500 kA.

Classification Based on Repetition Rate

- 1.Repetition Rate...A. Up to 5 PPM
- 2.Repetition Rate...B. Up to 1 PPS
- 3.Repetition Rate...C. Up to 10 PPS
- 4.Repetition Rate...D Up to 100 PPS
- 5.Repetition Rate...E. Over 100 PPS.

Classification Based on Temperature

- 1.Category ...L 0 to 45° C ambient.
- 2.Category ...H 0 to 50° C ambient.

Classification Based on Storage Temperature

- 1.Category ...L1 0 to 70° C ambient.
- 2.Category ...H1 0 to 50° C ambient.

Classification Based on Inductance value

- 1.Category 1 ...15 to 60 nH
 - 2.Category 2....61 to 150 nH
 - 3.Category 3....above 150 nH
- (Low Inductance Capacitors can also be supplied against specific requests.)

Rating

Rated percentage voltage reversal
The preferred values of voltage reversals are 20% to 80%.
(Voltage reversals against specific request can also be supplied.)

Overload

The max. Permissible overload current shall be 1.1 times the rated peak discharge current at rated percentage voltage reversal and rated voltage. Where....

$I (\text{peak}) = K \times UR \times (C/L)$ 0.5 and K is a constant depending on percentage voltage reversal.

Electrical tests

- Test for capacitance
 - Voltage test between terminals
 - Voltage test between terminals and container
 - Measurement of dissipation factor
 - Measurement of Equivalent Series Impedance (ESL)
 - Measurement of Equivalent Series Resistance (ESR)
 - Capacitor Discharge test
 - D C Life test
 - Life Expectancy / Endurance test
 - Insulation Resistance Test
1. Between terminals
 2. Between terminals and the container
- Sealing test
 - Charge / Discharge cycle test

Quality Management System

ISO 9001

Safety Regulations

When installing the equipment, relevant IS recommendations shall be observed.

Quality management system: ISO 9001, BS 5750

Qualifications

EDF (HN 54-S-05), CSA.

Temperature range

Capacitors are designed for operation between -40°C to +55°C.

Manufacturing and Quality Control

Imported bi-axially oriented double hazy Polypropylene film and 99.9% pure aluminum foil are used as dielectric and electrode. Wrinkle free winding of the elements is carried in a Class 100 environment on a Semi-Automatic winding machine with edge and end folding of the aluminum foil.

This is to eliminate over voltage stress at the edges of the buried area of the foil.

Each wound element is tested for DC Overvoltage with stand and adequacy of margins between Al foils and pin holes.

Numbers of elements are interconnected in series – parallel to achieve the desired capacitance and designed voltage rating of the Capacitor.

The dry pack is wrapped with several layers of high quality insulating paper before inserting it into a pretreated / sheet metal container grade SS 409 L and the top lid is welded by semi-automatic Pulsed TIG welding machine.

Specially designed F G molded bushings of desired creepage distance and mechanical strength are fitted on the lid in such a way that termination is achieved as required to achieve desired inductance.

The capacitors are then processed in a PLC controlled autoclave for drying and under heat @ 85°C and vacuum not less than 0.001 torr for a given period. After confirming the quality of drying by precision online monitoring instruments, the capacitors are then impregnated under vacuum with highly purified and degassed Jarylec C-101.

The capacitors are then subjected to all routine tests in accordance to IS 13666:1993

Painting

After completion of electrical tests, the capacitors are then loaded on a overhead conveyerised painting system.

The capacitors are first subjected to sand blasting which ensure removal of welding burrs, minor scratches etc. making the surface perfect compatible for painting. Thermal spray is also done against specific orders. The capacitors are then painted in a painting booth with semi-automatic painting gun with two coats of epoxy primer followed by two coats of epoxy air drying paint.

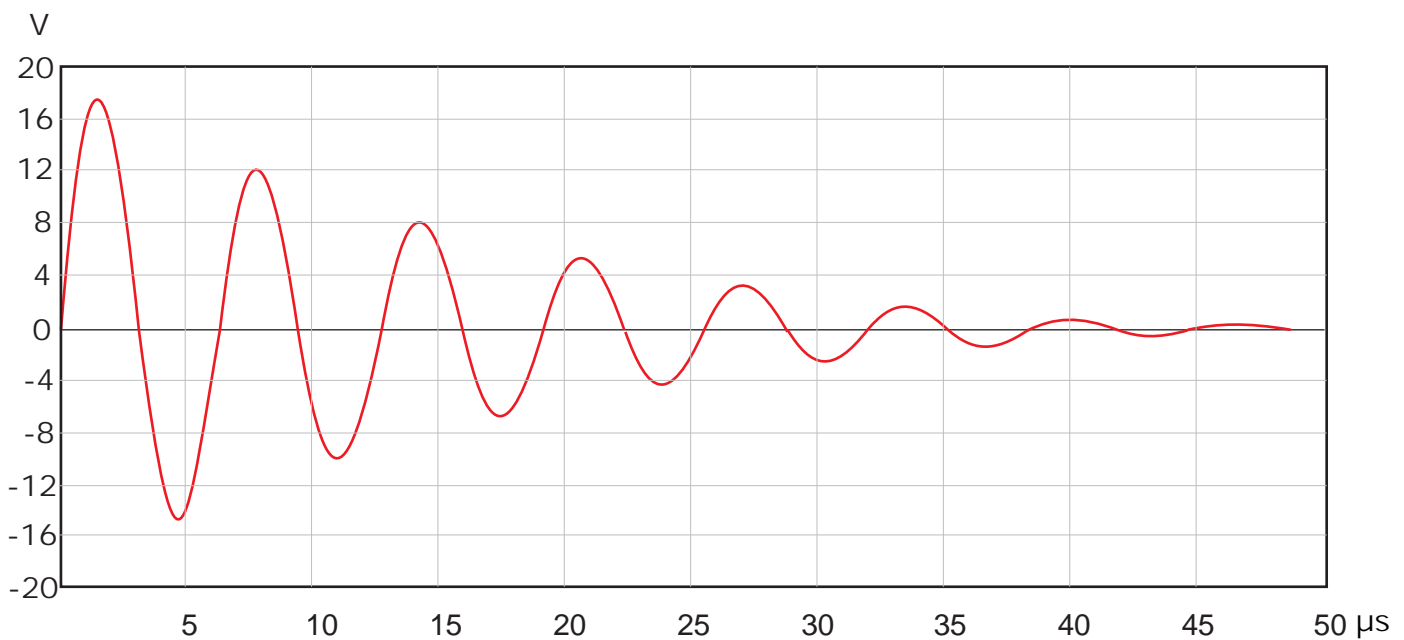
The paint layers are tested at random for adhesion to the surface of the capacitor.

Mounting

Surge Capacitors may be mounted vertically or horizontally as required.

Life Expectancy

Based on the state of art plant & machinery, quality of raw materials used, manufacturing under strict quality control and process using precision on line instruments, and elevated over voltage test results under extreme temperatures, capacitors are assured of minimum 20 years life.



DISCHARGE WAVEFORM OF 1µf, 100kV DC CAPACITOR

