

## INFORMATION ON INTERNATIONAL STANDARDS

- **SAFETY**

Electronic devices such as TV sets, radios, computers, stereos, hair dryers, washing machines, etc. are all connected to the mains power supply and all generate «noise».

Since these devices, even when in the off mode, are continuously connected to the mains they must comply with rigorous safety standards. In addition, the noise they generate can be picked up by TV sets and radios in the form of visual and audible distortions and, in the case of computers, as malfunctions and errors.

This noise must be filtered or suppressed.

- **MAIN INTERNATIONAL COMMITTEES**

- IEC (International Electrotechnical Commission)
- CEN (European Committee for Standardization / Comité Européen de Normalisation)
- CENELEC (European Committee for Electrotechnical Standardization / Comité Européen de Normalisation Electrotechnique)

Note: EN . . . (European Standard / Norme Européenne)

- **NEW EUROPEAN STANDARD (EN 60384-14)**

With the aim to standardize all the European National Standards and have only one Standard of reference in all the member countries of CENELEC, EN 132400 Standard was issued on 26th June, 1995 replacing all the European National Standards in force up to that date.

The European Standard EN 132400 was identical to the International Standard IEC 60384-14 2nd Edition 1993. The IEC and CENELEC Committees had worked in order to have the two standards identical also in the name: now the European Standard EN 132400 has been superseded by EN 60384-14 that is identical to the International Standard IEC 60384-14.

Effects of the coming into force of EN 132400 Standard:

- since 26th June 1995 it is no longer possible to request approvals according to the old European National Standards (VDE, ASEV, IMQ, etc.);
- any national body can issue the approval and its validity is recognized by the bodies of all the other CENELEC member countries with no need to repeat the tests;
- marking: the coordinating committee has released their unified logo (**ENEC mark** = European Norms Electrical Certification) that is recognised throughout Europe as being equivalent to the individual marks of countries. It is issued for Luminaries and components, IT equipment, transformers, switches, suppression capacitors and filters.  
At present, the name of the standard IEC 60384-14, is stamped near the logo of the institute performing the tests. Please note that if the component is approved according to the IEC 60384-14 or EN 132400, it is no longer necessary to stamp the marking relevant to the old European National Standards;
- approval certificates relevant to the old European National Standards: they remained valid till to 26th June 2000.

- **SIGNIFICANT TESTS OF THE IEC 60384-14**

Listed below you find the summary tables and some information on the most significant tests of the 60384-14 Standard (see table 1, 2 and 3).

Table 1

| Test                                  | IEC 60384-14 |
|---------------------------------------|--------------|
| Impulse voltage before Endurance test | YES          |
| Active Flammability test              | YES          |
| Passive Flammability test             | YES          |

Table 2

| Application            | Peak pulse in service | Peak impulse before endurance test        | Sub-class IEC 60384-14 |
|------------------------|-----------------------|---|------------------------|
| High pulse application | >2.5kV; ≤4.0kV        | 4 kV per C ≤ 1μF<br>4/√C kV per C >1μF    | X1                     |
| General purposes       | ≤2.5kV                | 2.5 kV per C ≤1μF<br>2.5/√C kV per C >1μF | X2                     |
| General purposes       | ≤1.2kV                | None                                      | X3                     |

Table 3

| Type of insulation bridged        | Rated voltage    | Peak impulse before endurance test | Sub-class IEC 60384-14 |
|-----------------------------------|------------------|------------------------------------|------------------------|
| Double or reinforced insulation   | ≤500Vac          | 8 kV                               | Y1                     |
| Basic or supplementary insulation | ≥150Vac; ≤300Vac | 5 kV                               | Y2                     |
| Basic or supplementary insulation | ≥150Vac; ≤250Vac | None                               | Y3                     |
| Basic or supplementary insulation | <150Vac          | 2.5kV                              | Y4                     |

- **CCA (CENELEC CERTIFICATION AGREEMENT) AND CB (CERTIFICATION BODY) TEST CERTIFICATE:**

These have their origin from an agreement taken by the Certification Bodies. Following these agreements, certificates are issued which are called CCA and CB certificates.

These certificates allow the mutual recognition at a European (CCA) and world (CB) level and are particularly effective in case the reference standards are the EN ...

- **MAIN STANDARDS FOR SUPPRESSION CAPACITORS**

## EUROPE

Reference Standard: EN 60384-14 (ex-former EN 132400)

This standard is identical to IEC 60384-14. It harmonizes and supersedes any previous national standards into only one European Standard

## U.S.A.

Reference Standard: UL 1414 and UL 1283

### UL 1414: Across-the-line applications

- Max capacitance value: 1μF
- Max operating temperature: +85°C
- Max Voltage: 250Vac

### UL 1283: Electromagnetic Interference filters

- The UL 1283 approval can be requested also for capacitance values higher than 1μF, temperatures higher than +85°C and voltages higher than 250Vac.

## CANADA

Reference Standard: CAN/CSA C22.2N°1 and CAN/CSA 384-14

### CAN/CSA C22.2 N°1 : Across-the-line applications

- Max capacitance value: 1μF
- Max operating temperature: +85°C
- Max Voltage: 250Vac

### CAN/CSA 384-14: Across-the-line applications

- The CAN/CSA 384-14 approval is identical to IEC 60384-14. It harmonizes and can be requested also for capacitance values higher than 1μF, temperatures higher than +85°C and voltages higher than 250Vac.

## CHINA

Reference Standard: GB/T14472

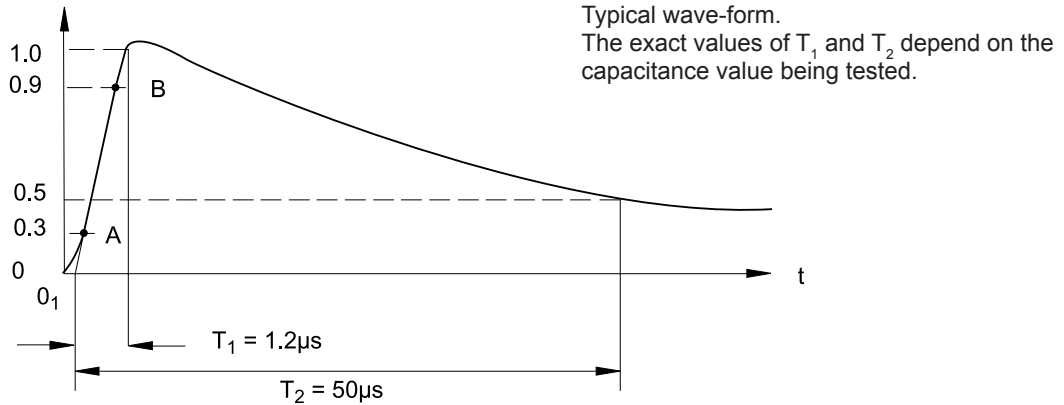
From August 1<sup>st</sup> 2003 all the old marks have been replaced by:

- **CCC** (China Compulsory Certification) which is compulsory and it is foreseen only for a list of more critical products. Capacitors are not included in this list (<http://www.cqc.com.cn/ccc/catalogueeng.pdf>)
- **CQC** is the general standard and mark of the new Body. It may be utilized in all other cases (e.g. for capacitors) and it is optional but very appreciated by Chinese Authorities and helpful in case the component is included in a product where CCC is compulsory .

# TESTS RELATED TO IEC 60384-14

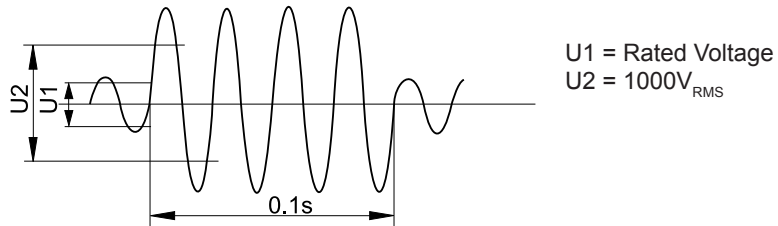
According to IEC 60384-14 our X1, X2 and Y2 suppression capacitors withstand the following tests (type test):

- IMPULSE VOLTAGE TEST (before ENDURANCE TEST)
  - $V_{PEAK} = 2.5KV$  (CLASS X2)       $V_{PEAK} = 4.0KV$  (CLASS X1)
  - $V_{PEAK} = 5.0KV$  (CLASS Y2)



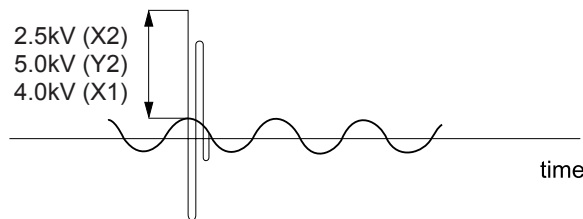
- ENDURANCE TEST
 

The capacitors are tested for 1000 hours at upper category temperature with a voltage of  $1.25 V_R$  for Class X2 and X1,  $1.7 V_R$  for Class Y2.  
Every hour the test voltage is increased up to  $1000 V_{RMS}/50Hz$  for a period of 0.1 s.



- ACTIVE FLAMMABILITY TEST
 

The capacitors are tested at the rated voltage ( $V_{ac}$ ) at 50 Hz with superimposed 20 pulses at 2.5kV for Class X2, 4.0kV for Class X1 and 5kV for Class Y2 with an interval between the successive pulses of 5 seconds.  
The rated voltage is kept for 2 min after the last discharge. At the end of the test the capacitor does not burn (control made with the cheese-cloth wrapped on the body of capacitors).



- CHARGE AND DISCHARGE TEST
 

The capacitors are subjected to 10000 cycles of charge and discharge at the rate of approximately one operation per second.

