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Electronic components – Long-duration storage of electronic components – Guidance for implementation

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This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

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Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned will transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of three years starting from 2005-09. The validity may be extended for a single three-year period, following which it shall be revised to become another type of normative document or shall be withdrawn.

INTRODUCTION

This PAS applies to the long-duration storage of electronic components.

Although it has always existed to some extent, obsolescence of electronic components and particularly of integrated circuits, has become increasingly intense over the last few years.

Indeed, with the existing technological boom, the commercial life of a component has become very short compared with the life of industrial equipment such as that encountered in the aeronautical field, the railway industry or the energy sector.

The many solutions enabling obsolescence to be resolved are now identified. However, selecting one of these solutions must be preceded by a case-by-case technical and economic feasibility study, depending on whether storage is envisaged for field service or production, for example:

– remedial storage as soon as components are no longer marketed;

– preventive storage anticipating declaration of obsolescence.

Taking into account the expected life of some installations, sometimes covering several decades, the qualification times, and the unavailability costs, which can also be very high, the solution to be adopted to resolve obsolescence must often be rapidly implemented. This is why the solution retained in most cases consists in systematically storing components which are in the process of becoming obsolescent.

The technical risks of this solution are, *a priori*, fairly low. However, it requires perfect mastery of the implemented process and especially of the storage environment, although this mastery becomes critical when it comes to long-term storage.

All handling, protection, storage and test operations must be performed according to the state of the art.

The application of the approach proposed in this document in no way guarantees that the stored components are in perfect operating condition at the end of this storage. It only comprises a means of minimizing potential and probable degradation factors.

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1 Scope

This Publicly Available Specification (PAS) is, first of all, a practical guide to methods of long-duration storage (more than five years) which summarizes the existing practices in the industry.

Unless otherwise specified, the approach, as well as the methods presented, apply to all families of electronic components, such as

- passive components, including quartz crystals, connectors and relays. However, components with "manufacturer's" specifications showing an expiry date or specific storage conditions are excluded from this document (for example, primary cells, storage cells, etc.);

- encapsulated or non-encapsulated active components of a silicon [Si] or gallium arsenide [GaAs] technology;

- micro-electronic assemblies.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-17:1994, *Basic environmental test procedures – Part 2: Tests – Test Q: Sealing*

IEC 60068-2-20:1979, *Environmental testing – Part 2: Tests – Test T: Soldering*

IEC 60410:1973, *Sampling plans and procedures for inspection by attributes*

IEC 61340-5-1:1998, *Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements*

IEC 61340-5-2:1999, *Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena – User guide*

IEC 61945, *Integrated circuits – Manufacturing line approval – Methodology for technology and failure analysis*

IEC 62380: *Reliability data handbook – Universal model for reliability prediction of electronics components, PCBs and equipment*

EN 190 000:1995, *Generic specification – Integrated monolithic circuits*