

# Card Service Life – A Review of ISO/IEC 24789



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On several occasions this year, I have referred to the new ISO/IEC 24789 Standard. Member national bodies approved both parts of this standard in June and it should be published shortly. The standard is a first attempt to deal with a quantitative process for determining card service life application profiles (Part 1) and test methods (Part 2). In this article, I will provide an overview of Part 1 of this important new standard.

Card service life is defined as “the period of time and usage for which a card retains the set of characteristics specified for its application under the conditions of use specified for that application from the time it is issued to the card holder.” Two parameters of card service life are defined: age and usage. The purpose of ISO/IEC 24789 is to provide guidance on methods and their use to predict a card’s service life.

ISO/IEC 24789-1 comprises a methodology for determining application profiles and their requirements. These application profiles and requirements provide a means for ranking and comparing the main factors affecting ID card service life in a manner that is suitable for testing using the methods defined or referenced in ISO/IEC 24789-2 (Methods of Evaluation). An application profile is defined as a “set of parameters that, in total, define the conditions of use specified for an application.”

Two consecutive processes are used to determine the application profile. First, the “raw” application profile is determined from three

variables: environment, storage and (card) reader profile. From these three factors, and an assessment of their respective probabilities of occurrence, age and usage “points” are calculated via a quantitative method described in the standard. The usage frequency and the card lifetime in the field have a strong impact on the various stresses the card will have to withstand. Consequently, a “corrected” application profile is calculated (again using the method described in the standard) utilizing an age coefficient (expected card service life in years) and a usage coefficient (number of uses per day +1). With this corrected application profile the aging and usage classes for the particular card application can be predicted.

After the aging and usage classes are determined, an evaluation regime can be established. This is the set of evaluation methods, together with their manner of combination and application. Two kinds of evaluation regime may be used to evaluate card service life: stand-alone methods and evaluation sequences. Stand-alone methods are performed on card samples and the results are directly interpreted as an indication of the card’s performance. An evaluation sequence comprises a sequence of aging and usage simulation methods followed by a set of evaluation methods to get an indication of the card’s performance after exposure. Only one of these evaluation regimes is to be selected in each case, in accordance with the guidance provided in the standard.

Stand alone testing, typically where small card batches are subjected to separate evaluation tests independently, are not allowed for certain aging classes, cards with IC’s, or embossed cards in this initial release of the standard. These cards

can only be subjected to evaluation sequence testing methods.

With the sequential test evaluation method the standard describes the minimum sequence requirements. These service life sequences consist of a number of simulation cycles that include at least aging simulation methods such as temperature and humidity exposure and usage simulation methods such as dynamic bending stress. Tests are contemplated for conformity to the application requirements for “end of service life” cards, which may include a comparison with “as new” cards that have not experienced a simulated service life. Evaluation methods may be selected from those described in ISO/IEC 24789-2 or adapted from relevant card testing standards. Usage simulation methods like dynamic bending stress are to be applied at the end of the aging cycle.

Once the evaluation regime is established, the standard suggests the range of tests to be performed based on card technology and the card’s intended use. Determination of test sequence parameters is provided by informative examples of various types of cards. Performance of the tests are conducted in accordance with the methods described in ISO/IEC 24789-2 and ISO/IEC 10373-1, 2 which are referenced in the standard for each of the suggested tests.

I hope this has been a helpful overview of the main elements of this important new standard. It is a starting point for providing an objective and quantitative assessment of card service life. Based on intended card usage and desired life, a set of accelerated aging tests and test methods are defined to help predict suitability for this intended use. In the longer term, correlation with a large sample of field data will help improve these standards. 