CHAPTER I
INTRODUCTION

Nowadays,smart card is an innovative technology that already intrudes itself to millions of people daily life.Smart card not only offers enhanced convenience but it also provides a higher level ofsafety and security. For example, smart cards can keep individualssecrets (personal information, bank accounts data, address etc.) from the people who carry them around and use them.

In general, smart card(also called chip or integrated circuit cards or ICCs) is a card that contains an embedded microprocessorinside of it. Normally, their appearances aresimilar to the conventional old style credit card. Smart cards can be divided in to two main categories. First is contact smart card, the contact smart card has a set of goldplated electrical contacts embedded underneath the surface of the plastic on one side. Another type of smart card is a contactless smart card. As the name implies, this typeof card is a plastic plate with a computer chip and an antenna coil embedded inside the card, hence, it requires non contact to the machine. The main applications of smart cards are payment, employee IDs in government or company, e-passports and other secure travel documents.

The smart card quality is determined by international standard (ISO/IEC10373-1) which defines the identification cards, test methods and general characteristics. And the size of the card is determined by an international standard (ISO 7810). This standard also defines the physical characteristics of the plastic such as tolerance to temperature and flexibility.Various commodity and engineering plasticsuch as PVC (polyvinyl chloride), PC (polycarbonate), and PET (polyethylene terephtarate) are used to produce smart cards body. First, PVC (polyvinyl chloride) is an amorphous thermoplastic material. The property of uncompounded PVC is colorless and rigid. However, the use of additives/stabilizers enables us to change the properties of the PVC. Second, PC (polycarbonate) is a polyester type polymer and classified as an engineering plastic. PC is an amorphous polymer. The major properties of PC include transparency, rigidity, substantial heat resistance, acid resistance (but not against alkalis), and good impact durability. Third, PETG (polyethylene terephtarate) is amorphous co-polyester. PETG is an excellent choice for applications

that flexible in processing, non-toxic, environmental friendly and easily to be recycled.

One of the limiting factors in the application of plastics is polymer degradation. The degradation can present an upper limit to the service life time of plastics as much as the possibility of mechanical property and visual loss. The service life time of smart card is required to guarantee how long the card can be used in daily life. Smart cards are often carried in wallets or pockets which is a fairly harsh environment for a chip. The plastic card in which the chip is fixed is flexible and the larger chip has higher probability of breaking.

The purpose of this work is to investigate the new material card to replace in commercial card. Then, the visual inspection, logical functionality and physical properties of card after testing in any conditions follow the standard tests were evaluated. Finally the service lifetime of any cards and the guideline the service lifetime of new material card were indicated.