

Name: Tang Wing Sum, Laura  
 Student I.D.: 2006212320  
 Journal: Science in Hong Kong

### **Ten-dollar polymer note: Polymer currency technology**

The Hong Kong currency includes notes and coins. There are all together three note-issuing banks which supply the city with \$10, \$20, \$50, \$100, \$500 and \$1000 banknotes. Besides issuing coins, the Hong Kong Monetary Authority has taken up the job in issuing \$10 banknotes since 2002 <sup>[1]</sup>. At the same time, a new kind of \$10 banknote was introduced into the market by the Authority. Before 2007, all banknotes being circulated in Hong Kong had been made of paper <sup>[1]</sup>. Nowadays, some of the banknotes being circulated in Hong Kong are made of polymer. They are the ten-dollar polymer notes (Figure 1). This is the first time for Hong Kong to introduce polymer notes to the community. Including Hong Kong, there are about 20 countries which adopt the polymer currency technology to produce banknotes <sup>[2]</sup>. In this article, the nature of polymer will be briefly discussed. The article will focus on its application to currency issuing.



**(Figure 1: The Hong Kong ten-dollar polymer note issued on 1<sup>st</sup> April, 2007)**

#### What is polymer?

Polymer is a kind of substance with high molecular weight. They are made of repeating unit of simple monomers <sup>[3]</sup>. They may be naturally occurring or chemically synthesized by the process of polymerization <sup>[3]</sup>. The properties of polymer depend on the structure of the molecule. They may be linear, cross-linked, branched or others <sup>[4]</sup>. Because of their diverse structures, they are very useful and have a wide range of applications.

#### Making banknotes

Different polymer substrates are available for manufacturing purposes, but the one used in

printing banknotes is unique and is not commercially available <sup>[5]</sup>. Hong Kong is using the polymer type called Guardian® <sup>[2]</sup>, and they are made from polymer biaxially-oriented polypropylene (BOPP) <sup>[6]</sup>. The BOPP is processed in the following steps: opacifying, sheeting, printing and overcoating <sup>[6]</sup>. Some of the processes just mentioned are new techniques. Traditional ones like offset, intaglio and letterpress printing process are also applied in manufacturing banknotes <sup>[2]</sup>. They involve employment of the BOPP, together with printing plates, special inks and high technology printing machinery <sup>[6]</sup>. After all processes, both sides of the notes are printed in colorful background designs, with numbers and texts having security features, together with the addition of protective overcoating in the final stage <sup>[6]</sup>.

### Talking about security

The main concern for issuing currency is to avoid counterfeiting threat. Therefore, security is very important. In this case, using polymer as material for making banknotes would possess more advantages than that of paper. This is because the security features of polymer notes are miscellaneous and require a lot of effort including time and money for production <sup>[7]</sup>. Some unique features like windows, vignettes and shadow images can only be applied on polymer but not paper <sup>[7]</sup>. This is because plastics can be made transparent while paper cannot. To apply the unique features, the ten-dollar polymer note in Hong Kong contains a clear window with a shadow image of the bauhinia flower in it <sup>[1]</sup> (Figure 2).



**(Figure 2: The clear window on the banknotes with a bauhinia flower on the top left hand corner.)**

### Other remarkable features

The other good features of having banknotes made of polymer instead of paper are that they are more durable, more environmentally friendly and are cleaner to use <sup>[5]</sup>. Being plastic, the polymer banknotes do not break as easily as those made of paper, and they cannot be marked easily. It is the polymer substrate that helps make plastics films non-fibrous and non-porous for printing banknotes. Unlike paper banknotes, polymer banknotes have a high strength in

resisting moisture and dirt <sup>[5]</sup>. As ten-dollar notes are being circulated in the community frequently, these properties make them more user-friendly. According to Note Printing Australia, polymer notes have a lifetime four times longer than that of paper <sup>[7]</sup>. That means they do not require replacement very often. Moreover, they are recyclable <sup>[5]</sup>. All these features make the polymer banknotes more environmentally friendly as well as less costly.

### Conclusion

The new polymer notes are generally better comparing to their paper counterparts. They are made of plastic that are water-proof, difficult to be torn and have higher resistance towards dirt and oils. They are environmentally friendly because the notes last longer. Most important of all, they are more difficult to counterfeit. Other countries in the world set examples for the success of using polymer currency technology. The Hong Kong government may want to get some of their experience and consult the public. It may also consider extending the use of this polymer technology to other field so as to raise the living standard of the Hong Kong citizens in the near future.

### Reference list:

- [1] Hong Kong Monetary Authority. *Ten dollar polymer note*. [online]. 2005. Available: <http://www.info.gov.hk/hkma/eng/polymer/index.htm>. Accessed: 2 February, 2008.
- [2] Polymer Bank Notes of the World 2007. *Hong Kong*. [online]. 2007. Available: [http://www.polymernotes.org/country\\_pages/hkg.htm](http://www.polymernotes.org/country_pages/hkg.htm). Accessed: 21 January, 2008.
- [3] Dictionary.com. *Polymer*. [online]. 2008. Available: <http://dictionary.reference.com/browse/polymer>. Accessed: 24 February, 2008.
- [4] Polymer Science Learning Centre 2008. *What is a polymer?* [online]. 2008. Available: <http://pslc.ws/macrog/kidsmac/basics.htm>. Accessed: 24 February, 2008.
- [5] Hong Kong Monetary Authority. *Hong Kong Ten Dollar Polymer Note*. [online]. 2005. Available: [http://www.info.gov.hk/hkma/eng/polymer/leaflet\\_polymer\\_eng.pdf](http://www.info.gov.hk/hkma/eng/polymer/leaflet_polymer_eng.pdf). Accessed: 2 February, 2008.
- [6] Museum of Australian Currency Notes. *A New Era- Polymer Currency Notes: 1988 Onwards*. [online]. 2008. Available: [http://www.rba.gov.au/Museum/Displays/1988\\_onwards\\_polymer\\_currency\\_notes/index.html](http://www.rba.gov.au/Museum/Displays/1988_onwards_polymer_currency_notes/index.html). Accessed: 31 January, 2008.
- [7] Note Printing Australia. *Banknotes*. [online]. 2007. Available: <http://www.noteprinting.com/banknotes.html>. Accessed: 22 January, 2008.