



Polymer banknotes

Durable and clean

The Bank of England is responsible for maintaining confidence in the currency, by meeting demand with good quality, genuine banknotes that the public can use with confidence.

To support this objective, for the past three years the Bank has been conducting a research project assessing the substrates (materials) that banknotes are printed on with a view to further enhancing counterfeit resilience and increasing the quality of banknotes in circulation. In particular, the Bank has been reviewing the relative merits of printing banknotes on polymer compared with cotton paper.

Durable

Over 20 countries currently issue polymer notes either for all or some denominations. Evidence from these demonstrates that they last significantly longer than paper banknotes, with precise duration depending on the country and denomination. For example, the Reserve Bank of New Zealand has stated the average polymer note lasts four times⁽¹⁾ as long as a paper note. Findings from our confidential research with other central banks provided the following average lifetime data for polymer:

Low denominations (most frequently handled)	Middle denominations	High denominations (least frequently handled)
3.8 x life of paper	4.5 x life of paper	6 x life of paper

This durability is because the physical structure of polymer banknotes is more resistant to damage and tearing than paper banknotes.

Clean

In addition to increased durability, the impermeable and non-fibrous nature of polymer means it repels dirt and moisture. This means polymer banknotes can stay cleaner for longer than paper banknotes, and they become less 'tatty'.

(1) http://www.rbnz.govt.nz/notes_and_coins/notes/.



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For example, if a polymer banknote is submerged in liquid such as red wine or fruit cordial, the impermeable nature of the material means it can be wiped clean, whereas a paper banknote will absorb the liquid and it will stain.



Polymer note after being submerged in red wine.



Paper note after being submerged in red wine.

Why this is important?

We are aware that banknotes play an important part in people's day to day lives, and feedback from the public suggests that they put a premium on good quality, clean notes. A number of factors can impact the state of a banknote in circulation, for example the climate, how the banknote is used (lower denomination, transactional banknotes tend to become 'tattier' quickly) and how soon used banknotes are withdrawn from circulation. The material that banknotes are made from can also have a significant effect on the longevity of the banknote and our research indicates that the combination of increased durability and cleanliness that polymer offers, can help us to maintain a good standard of quality banknotes in circulation.

The durability and cleanliness of polymer banknotes brings additional benefits — it is easier to check the security features on cleaner banknotes and therefore harder to pass a counterfeit.

Testing

As well as considering the evidence from those countries which issue polymer banknotes, the Bank has conducted its own analysis. The Bank has a range of laboratory tests on paper and polymer banknotes using mechanical abrasion equipment and commonly available household chemicals. The results show that the base polymer substrate is more durable than paper in the majority of circumstances. For example, a standard washing machine cycle has a minimal effect on a polymer banknote, whereas for our current paper banknotes, the print quality can be substantially degraded.

However, no banknote is indestructible, and whilst we expect the public to look after their banknotes, there are circumstances where polymer banknotes can be damaged.

For example, polymer banknotes begin to shrink and melt at temperatures above 120°, so they can be damaged by ironing for example. Paper banknotes also react to extreme heat. The ink on polymer



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Polymer note after washing machine cycle.



Paper note after washing machine cycle.

banknotes will eventually wear towards the end of their useable life, whereas paper banknotes become limper and heavily soiled. In addition, although the initial tear resistance of polymer banknotes is high, once they have a nick they can tear easily.

Next steps

Following our research programme, the Bank is considering the introduction of polymer for the recently announced Sir Winston Churchill and Jane Austen notes. However, we recognise that the public takes great pride in their banknotes, and that changes to the design and format of notes are consequently of great interest. Because of this we have decided to consult with the public before making any final decisions.

Therefore the Bank will be running a consultation programme between 10 September and 15 November that will provide the public with a greater familiarity with polymer banknotes. The consultation will, in turn, provide us with a better understanding of the public's views on the proposed change and, whether such a change would meet with broad public acceptance. A final decision will be announced in December.

If you would like to provide feedback on polymer banknotes please complete the online comment form on our website by 15 November 2013:
www.bankofengland.co.uk/banknotes/polymer
For further information telephone 020 7601 4878

