



Co Processing of Paper & Polymer Banknotes. A Systems Approach

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Global technology support for Guardian® polymer substrate



CO PROCESSING OF POLYMER & PAPER BANKNOTES

OVERVIEW

- INTRODUCTION OF POLYMER NOTES
- NOTE DESIGN
- IMPACT FOR BANKNOTE PRINTERS
- ROLE OF THE CENTRAL BANK
- INDUSTRY STAKEHOLDERS
- MANUAL HANDLING
- DESKTOP BANKNOTE PROCESSING MACHINES
- HIGH SPEED BANKNOTE PROCESSING MACHINES
- CONCLUSION



INTRODUCTION OF POLYMER BANKNOTES

The introduction of polymer banknote technology brought a new dimension to the printing and currency industries.

For the technology to be readily accepted by the industries it needed to be complementary to existing processing systems.

As polymer has gained a foothold key industry stakeholders have embraced the technology.

Processing systems continue to mature.



BANKNOTE DESIGN

Banknote design has been impacted by the introduction of polymer technology.

Increased collaboration between stakeholders.

Visual points of differentiation have been introduced.

Banknote design should factor in unique polymer characteristics for machine processability.



IMPACT FOR PRINTERS

Printing with polymer is an extension of existing processes

Points of differentiation include:

- Set up
- Pre press
- Process flow
- Logistics and material
- Managing more than one material



PRINTERS OF POLYMER SUBSTRATE

COUNTRY	PRINTER	FIRST PRINT
Australia	Note Printing Australia	1988
Thailand	Bank of Thailand Printing Works	1997
Taiwan	Central Engraving and Printing Plant	1999
China	China Banknote Printing and Engraving Corporation	1999
Canada	Canadian Bank Note	1999
Brazil	Casa da Moeda do Brasil	2000
Romania	R.A. Imprimeria Băncii Nationale a României	2001
Austria	Oesterreichische Banknoten-und Sicherheitsdruck GmbH	2001
Vietnam	National Banknote Printing Plant	2001
Mexico	Banco de Mexico	2002
Switzerland	Orell Fussli Security	2003
Malaysia	Giesecke & Devreint	2006
Nigeria	Nigerian Securities Printing Mint	2007
South Africa	South African Bank Note	2007



ROLE OF THE CENTRAL BANK

The central bank has a pivotal role to play in the currency value chain.

Influencing decisions include:

- Stakeholder relationship
- Conversion timeframe
- Degree of co processing
- Trigger points of separation
- Extent of machine processing
- Destruction and disposal



INDUSTRY STAKEHOLDERS

The degree of co processing will have varying influences on the various stakeholders including:

- Commercial and retail cash handlers
- Cash in Transit companies
- Commercial banks and other financial institutions
- Central Banks



CONVERSIONS TO DATE

Co-processing periods in countries converted at least partially to polymer:
(Number of years of co-processing starting from conversion of 1st circulating denomination)

	Countries	No. of Denoms	Co-processing Period	Manual	Machine
100% conversion to polymer	Australia	All (5)	4 years: 1992-1996	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	New Zealand	All (5)	1 year: 1999-2000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Romania	All (6)	4 years: 1999-2003	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Vietnam	All (6)	3 years: 2003-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Brunei	All (8)	10 years 1996-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Majority conversion (more than 50% of denominations)	Papua New Guinea	5 out of 6	9 years: 1996-2005	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Conversion of at least one circulating denomination	Chile	1 out of 7	2 years: 2004-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Malaysia	1 out of 6	2 years: 2004-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Mexico	2 out of 6	4 years: 2002-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Nepal	1 out of 9	4 years: 2002-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Samoa	1 out of 6	15 years: 1991-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Singapore	3 out of 7	2 years: 2004-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Zambia	2 out of 8	3 years: 2003-2006	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Nigeria	1 out of 8	0 years 2007-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Hong Kong	1 out of 6	0 years 2007-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Guatemala	1 out of 7	0 years 2007-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



MANUAL HANDLING

The co processing of polymer and paper banknotes will have an influence on the following aspects of manual handling;

- Verification of authenticity
- Counting
- Sorting
- Storage



DESKTOP BANKNOTE PROCESSING MACHINES

Desktop processing machines are employed extensively throughout the currency industry. Co processing of paper and polymer banknotes is likely to be influenced by;

- Manual handling techniques
- Machine programming
- Calibration of feed mechanism
- Authenticity verification detectors



HIGH SPEED BANKNOTE PROCESSING MACHINES

High speed banknote processing and sorting machines are used extensively by central and commercial banks together with cash in transit companies. Factors influencing co processing include;

- Programming of sensors for machine readable features
- Calibration of transport/feeder systems
- Machine process set up
- Output pockets configuration
- Banding systems
- Shredders/granulators



CONCLUSION

The emergence of polymer as an alternate, viable and cost effective substrate for banknote technology has brought with it exciting opportunities together with challenges.

For banknote printers, polymer should be seen as a further extension to the variety of substrates currently available.

For central banks, polymer is an enhanced weapon against counterfeiting and a significant improvement in durability.

Developments in process systems ensure the functionality of co processing polymer and paper.