

Code of Conduct for the Authentication of Machine-Dispensed Banknotes

ACBI
The Association of Commercial
Banknote Issuers

Bank of England



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Definitions

ATM

Automated Teller Machine – also known as a cash machine. For the purposes of the Code, this definition includes customer operated deposit and recycling machines.

ATM settlement scheme

A generic term for the entity that offers ATM products and services and which provides the organisational, legal and operational framework rules necessary for the services marketed by the brand to function.

Customer-operated cash dispensers (COCDs)

Devices which dispense banknotes to a customer without requiring the intervention of a member of staff in the transaction. These include ATMs, self-service checkouts, vending or ticketing machines and any other machines which dispense banknotes as change or winnings. These all share a key characteristic: the member of the public receives banknotes from a COCD rather than a member of staff. This makes it harder for the member of the public to raise concerns about the authenticity of the banknotes received, making it even more critical that they are authenticated rigorously.

Local recycling

The practice of filling customer-operated cash dispensers with banknotes tendered by the public without these notes being sent via a wholesale cash processor, for example deposits at a bank branch being used to refill an ATM. Such practices bypass the controls in place in the wholesale cash sector which works to strict standards to ensure only genuine, fit notes reach the public. Locally recycled banknotes need to be authenticated to the same standards to ensure the public can be confident that the banknotes they receive are genuine.

Machine

A device that automatically decides whether a banknote is counterfeit or genuine. To be compliant with the Code, the machine used must be listed by either or both of the Bank of England and the Association of Commercial Banknote Issuers¹ on the relevant Framework for the Testing of Automatic Banknote Handling Machines ('Framework')². Some Machines can also sort and separate banknotes into different categories such as genuine fit, genuine unfit, and suspect or counterfeit. They reach a judgement automatically, whereas tools such as UV lamps and detector pens rely on the user to make a decision about whether the banknote is genuine or suspect and generally test only one aspect of the banknote's security features.

For a Machine to outsort 100% of known counterfeits, it is important that it runs a software and/or firmware version listed on the relevant Framework. (Firmware is a set of code instructions that typically govern the interaction between a device's hardware and software.)

Organisation

The Code applies to all Organisations which operate customer-operated cash dispensers, whether these are dispensing notes as part of a withdrawal from an account, as change or as winnings. Annual reporting on compliance with the Code applies to those Organisations which operate ATMs (e.g. LINK Network Members which are not Card Issuer Only Members, or Organisations with a direct relationship with another ATM settlement scheme) and Organisations which operate self-service checkouts, as described in Table 1, page 5.

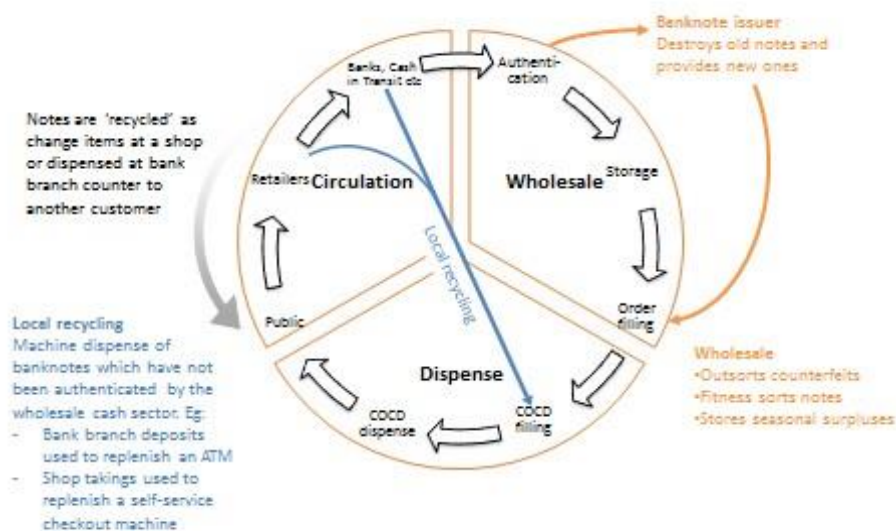
¹ <https://www.bankofengland.co.uk/banknotes/retailers-and-businesses/testing-automatic-banknote-handling-machines> and <https://www.acbi.org.uk/testing-automatic-machines.html>

² Test results for machines are located in one published spreadsheet on the Bank of England Framework web page. Users can read across which machines have met either or both standards under the Frameworks in one place. The ACBI Framework test results links to this page, which is updated monthly.

Introduction to banknote circulation and authentication

Cash is an important part of the UK's payment services – the British public spend around £80 billion each year in cash (*Cash and Cash Machines 2021*, UK Finance). For the public to trust and want to continue to use cash, they need to be confident that the banknotes they acquire are genuine.

There have been many developments which have increased the security and/or efficiency of banknote circulation, such as enhanced anti-counterfeiting features and the rise of ATMs. Recent advances in cash-handling technology are leading a number of financial institutions, ATM operators, retailers and other organisations to consider using banknotes tendered by the public to refill ATMs, self-service checkouts or other customer-operated cash dispensers (COCDs). These innovations help to keep cash cost effective as a payment mechanism, but they also change the way cash circulates, as shown below:



Wholesale cash processors (i.e. banknote processors contracted by the Bank of England³ and / or one of the Scottish and Northern Ireland Issuing Banks⁴) are the bulk suppliers of the vast majority of banknotes in the UK and work to strict standards to ensure that only genuine, fit notes reach the public. But the wholesale method can be supplemented by notes 'recycled' locally and then dispensed through COCDs, outside the wholesale cash industry's quality controls. These banknotes need to be authenticated to the same standard to ensure that the public can always trust that the banknotes they receive are genuine regardless of where they receive them.

Whether dispensing to, or receiving banknotes from, the public, all organisations in the cash cycle benefit from the continued confidence which robust industry-wide authentication ensures. If, for example, counterfeit banknotes were dispensed through an ATM it could damage public confidence in cash more generally, as well as damaging the reputations of both the specific ATM provider and of ATMs in general. The same would be true for a self-service checkout or any other COCD, and the efficiency of cash – in terms of transaction times and volumes processed – could be negatively impacted.

A particular problem may occur if a counterfeit note is dispensed from a COCD: the customer may be uncertain whether to approach his/her bank, the store or machine owner, the ATM settlement scheme or the issuer. It would also be harder for the customer to demonstrate that the note was dispensed by the particular COCD, and for the Organisation to verify whether the note was dispensed by the COCD or whether it came from another source.

³ Processors contracted to the Bank of England are the Note Circulation Scheme (NCS) members and the Northern Ireland Storage, Sorting & Issuing Banks. The NCS Members are G4S Cash Centres (UK) Ltd, Post Office Ltd, Royal Bank of Scotland plc and Vaultex UK Ltd (a joint venture between Barclays Bank and HSBC Bank). The Northern Ireland Sorting Banks are Bank of Ireland, Ulster Bank and Danske Bank.

⁴ Some of the Scottish and Northern Ireland Issuing Banks undertake their own wholesale cash processing; others contract to another member, G4S Cash Centres (UK) Ltd or to Post Office Ltd.

Scope

To help maintain confidence in the currency, **the Code requires Bank of England and Scottish and Northern Ireland Issuing Bank banknotes which are dispensed through Customer-Operated Cash Dispensers to be either processed by the wholesale sector,⁵ or authenticated by a Machine which is listed on the relevant Framework for the Testing of Automatic Banknote Handling Machines ('Framework').⁶ The Code does not cover banknotes dispensed by hand, for example notes returned as change/cashback at staffed tills or paid out over a staffed bank branch counter⁷.**

The Machines listed on the Frameworks range from inexpensive point-of-sale authenticators to industrial-scale note sorters. All of them test a number of banknote security features quickly and simultaneously. They also determine authenticity automatically, whereas tools such as UV lamps and detector pens generally test only one aspect of the banknote's security features and rely on the user to make a judgement about whether the banknote is genuine or suspect. A number of on-the-ground process changes may need to be made by financial institutions, large and small retailers or other COCD operators to ensure the effective use of Framework-listed Machines.

COCDs are responsible for around three-quarters of public cash acquisition, primarily through ATMs. The Code sets out standards for the authentication of banknotes which will be dispensed through COCDs. While other methods of banknote dispense are out of scope for Code compliance, the Principles of the Code can also helpfully be applied to banknotes dispensed to the public by any means, e.g. staffed tills or branch counters, and would be the most robust way to authenticate banknotes tendered by customers.

The Code relates to the recirculation in the United Kingdom of banknotes issued by the Bank of England and any of the six banks in Scotland and Northern Ireland which are authorised to issue banknotes⁸.

While banknote quality sorting is not a requirement of the Code, it is strongly encouraged for Bank of England notes and extensive guidance on the standards that apply are provided in Appendix 1. The six Scottish and Northern Ireland Issuing Banks maintain their own minimum quality standard for banknotes. Guidance can be sought from the individual banknotes issuers and is not described anywhere in the Code.

Details of the methods of reporting compliance by sector can be found in the appendices, as detailed in Table 1:

Table 1 (Further guidance on the table below is in Appendix 2 (p.12))

COCD type	Organisation responsible for compliance ('Organisation' hereafter)	Reporting Appendix
LINK ATM (with or without internal recycling)	The LINK ATM Operating Member	p. 14
Non-LINK ATM (with or without internal recycling)	The organisation with the contractual relationship to the settlement scheme	p. 15
Self-service checkout (with or without internal recycling)	The retailer	
Other COCDs	The organisation which is offering the service supplied by the machine (e.g. the ticket vendor, or gaming centre operator)	p. 16

⁵ Including notes provided directly by the note issuer (e.g. new notes) and not processed any further by wholesalers.

⁶ <https://www.bankofengland.co.uk/banknotes/retailers-and-businesses/testing-automatic-banknote-handling-machines> and <https://www.acbi.org.uk/testing-automatic-machines.html> Where the Organisation is using a Machine not listed on the Framework, the Organisation should approach the manufacturer to ensure the Machine is put forward for testing.

⁷ For advice and educational materials on how to manually identify genuine banknotes, please see <https://www.bankofengland.co.uk/banknotes/counterfeit-banknotes/how-to-check-your-banknotes>. All cash-handling businesses can also sign up as a supporter of the Banknote Checking Scheme, which promotes banknote checking of Bank of England banknotes at point of sale through targeted training. The Scheme is voluntary and free to join – for more details, see <https://www.bankofengland.co.uk/banknotes/banknote-checking-scheme>.

⁸ Three banks are authorised to issue banknotes in Scotland: Bank of Scotland plc; Clydesdale Bank plc; and The Royal Bank of Scotland plc. Three banks are authorised to issue banknotes in Northern Ireland: Bank of Ireland (UK) plc; Northern Bank Limited (trades as Danske Bank); and National Westminster Bank Limited trading as Ulster Bank. Further information about this authorisation is available on <https://www.bankofengland.co.uk/banknotes/scottish-and-northern-ireland-banknotes>

Principles of compliance

Principle 1 All Bank of England banknotes and Scottish and Northern Ireland Issuing Bank banknotes (“S&NI banknotes”) dispensed by COCDs must be authenticated using a Machine listed on the relevant Framework for the Testing of Automatic Banknote Handling Machines⁹ (‘Framework’).

An Organisation¹⁰ meets the requirement of Principle 1 by refilling COCDs using notes acquired from one or more of the following sources, in the following ways:

- 1.1. Bulk supply – notes which have been delivered to the Organisation by a bulk third party supplier. Notes must be Machine-authenticated prior to their delivery to the Organisation. Authentication can take place in two ways:
 - 1.1.1. Wholesale - notes authenticated by the note issuer or another cash processor according to the terms of a contract it has with the note issuer.¹¹ These notes are authenticated robustly and compliance is monitored by the issuer. The authenticated notes may be sold to Organisations directly by these cash processors or via other bulk suppliers; the notes are compliant with this principle as long as the Organisation’s supplier is able to confirm that they have not been recirculated since this authentication was undertaken.
 - 1.1.2. Other bulk supply – notes not authenticated by, or under a direct contract with, the note issuer. These notes must be authenticated by a cash processor using a Machine and software/firmware version listed on the relevant Framework.⁶ The processor must also comply with principles 2.1, 3, 4.1, and 4.4. The authenticated notes may be sold to Organisations directly by the processor or via other bulk suppliers – the notes are compliant with this principle as long as the Organisation’s supplier is able to confirm that they have not been recirculated since this authentication was undertaken.

Organisations should confirm with their note supplier that notes are authenticated in accordance with either principle 1.1.1 or 1.1.2. No further action on the part of the Organisation is required to ensure compliance with the Code, beyond abiding with paragraph 4.2 and completing an annual review of compliance as set out in paragraph 4.5.

- 1.2. Locally-sourced – any notes not sourced from a bulk supplier. Locally-sourced notes must be authenticated using a Machine and software/firmware version listed on the relevant Framework.⁶ This authentication may occur at any point prior to dispense by the COCD, such as: during initial acceptance at point of sale; during back-office reconciliation; immediately prior to refilling COCDs; or by the COCD itself as part of loading the notes into it.
- 1.3. Sources may be used in combination provided all are compliant with the Code. It is the Organisation’s responsibility to ensure that its procedures or, where appropriate, its contracts, reflect the requirements of paragraph 1.1 and/or 1.2. Guidance on how to achieve this is set out in Appendices 2 and 3.

⁹ See footnote 6, page 5.

¹⁰ As indicated in Table 1, page 5. Further guidance on compliance by Organisation sector is provided in Appendix 2.

¹¹ See footnotes 3 and 4, page 4 and footnote 5, page 5.

Principle 2 Notes recycled and dispensed to the public must be authenticated as genuine.

2.1. Any banknotes rejected by the Machine during the authentication process must not become mixed into working stocks. Where the banknote is rejected as it is not a design recognised by the Machine, the Organisation should authenticate the note using a backup authentication process (see Principle 4.3) but the banknote should not be loaded into the COCD. Where a rejected banknote is suspected to be a counterfeit and is retained, the Organisation should follow the issuing bank's advice on what to do if you get a counterfeit note¹², or send the suspect banknote via the wholesale process where this option exists. A log of suspected counterfeits retained must be kept.

2.2. Authenticated notes dispensed by COCDs must either be on the Bank of England's list of current series notes¹³, or on the ACBI's list of S&NI banknotes which are able to be recycled.¹⁴

Principle 3 Machines must be maintained in line with the manufacturer's guidance and use a software/firmware version which separates out 100% of known counterfeits. Staff must not bypass or modify counterfeit detection settings.

3.1. Where a Machine is used to authenticate notes for COCD dispense, its software/firmware must be listed on the relevant Framework. Listed software/firmware versions have been tested against a counterfeit test pack and shown to identify and separate out 100% of known counterfeits or are temporarily listed awaiting testing given only minor, low risk, changes to the previously tested software version, such as the inclusion of a new design banknote into the template. Where a version currently used is delisted, Organisations must have started the process to update to a currently-listed version within three months of delisting. The Organisation, as set out in Table 1 (on page 5), is responsible for checking this whenever the Machine's retest is updated, typically annually.

3.2. In order to ensure effective detection of new counterfeits, urgent software/firmware updates may sometimes be communicated and issued by manufacturers. Organisations must ensure they give Machine manufacturers up-to-date contact details for this purpose. To prevent counterfeit acceptance, the Organisation should follow the direction by the manufacturer in these cases and update Machines as soon as possible, preferably within 28 calendar days of the notification from the manufacturer.

3.3. The Organisation must ensure that the counterfeit detection capability of the Machine cannot be altered or disabled by staff when using it to authenticate notes. Where this is not physically possible, staff must be instructed not to do so.

Principle 4 Internal processes must be sufficient to ensure Principles 1-3 are adequately supported.

4.1. All staff responsible for operating Machines must be appropriately trained in their operation and understand the importance of Code compliance for confidence in the currency.

4.2. Authenticated notes not loaded directly into the COCD must be adequately labelled in a way that identifies them as being authenticated and segregated¹⁵ from those which have not been sorted until they are loaded into the COCD.

¹² Bank of England notes: <https://www.bankofengland.co.uk/banknotes/retailers-and-businesses>; Scottish and Northern Ireland Issuing Bank notes: <https://www.acbi.org.uk/counterfeit-notes.html>

¹³ <https://www.bankofengland.co.uk/banknotes/current-banknotes>

¹⁴ <https://www.acbi.org.uk/banknotes.html>

¹⁵ That is, kept separated from other, e.g. unsorted, notes in a manner which the Organisation is confident would prevent contamination by unauthenticated notes.

- 4.3. A backup authentication process must be in place in the event of a Machine being temporarily inoperable. Advice for businesses on cash handling is available on the Bank of England's website¹⁶ and the Association of Commercial Banknote Issuers' website¹⁷. The Machine must be repaired or replaced within 28 calendar days.
- 4.4. The materials referenced in this Code via external links are subject to change from time to time. The Organisation must review these regularly, at least annually, to ensure ongoing compliance.
- 4.5. It is the responsibility of the Organisation which provides the COCD for public use to ensure this Code is adhered to. Where the COCD is an ATM or a self-service checkout, the Organisation must declare its compliance with this Code at the point of its annual attestation/self-certification following the relevant compliance appendix (see pages 14 and 15 of this Code).

¹⁶ <https://www.bankofengland.co.uk/banknotes/retailers-and-businesses>

¹⁷ <https://www.acbi.org.uk/banknotes.html>

Code of Conduct for the Authentication of Machine-Dispensed Banknotes

Guidance and ancillary documents

The pages which follow may be useful guidance on how an Organisation can comply with the *Code of Conduct for the Authentication of Machine-Dispensed Banknotes*. They do not contain additional requirements.

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Appendix 1: Quality settings for recycled banknotes

The recirculation of good quality banknotes is important for reliable authentication and reliable machine dispense. While banknote quality sorting is not a requirement of the Code, it is strongly encouraged, particularly for those who are undertaking local recycling on a significant scale. Where possible, Bank of England banknotes not meeting minimum standards should be deposited with a bank or wholesale cash processor rather than recirculated, so they can be removed from circulation and replaced by the issuer. Minimum quality standards for Scottish and Northern Ireland Issuing Bank banknotes are set individually by each issuer and quality sorting is not a requirement of the Code.

Any future formalisation of minimum quality standards in the Code would first require a further public consultation. Code Sponsors would seek to ensure that any such policy would not render authentication-only Machines which are already deployed redundant.

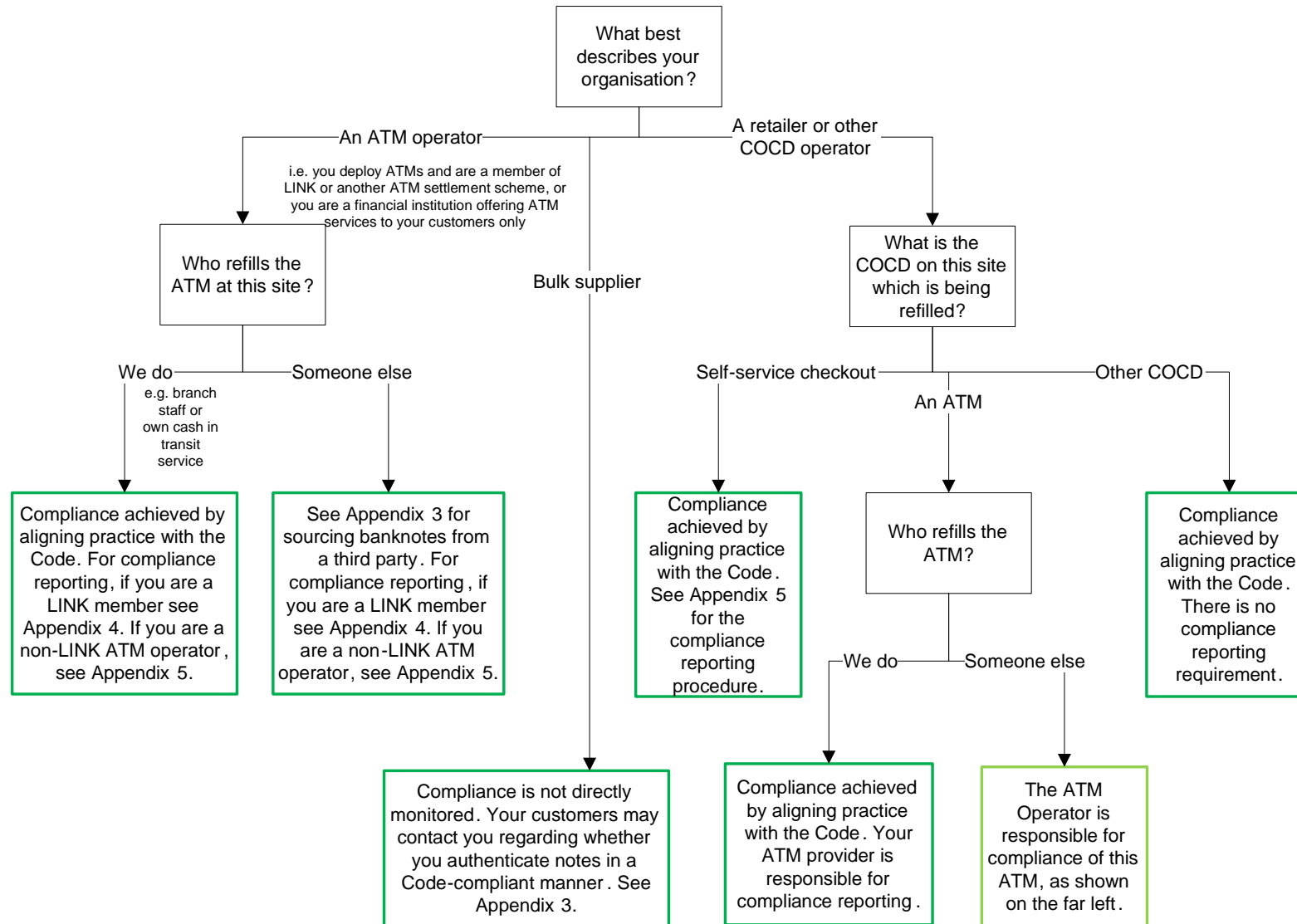
The minimum standards for Bank of England banknotes are as follows:

Feature	Definition	Unfit Criterion	
		Polymer £5s, £10s, £20s, & £50s	Paper £10s, £20s & £50s
1. Edge Tear	A break in the surface of the note (cut or tear) that reaches any edge of the note	3mm	5mm
2. Slit	A break in the surface of the note (cut or tear) that does not reach any edge of the note	5mm	20mm
3. Hole(s)	Missing portion that does not include any part of an edge of the note	3mm ²	10mm ²
4. Missing Edge Portion(s)	Missing portion including a part of at least one edge	50mm ²	50mm ²
5. Tape	Adhesive tape stuck to the note	100mm ²	300mm ²



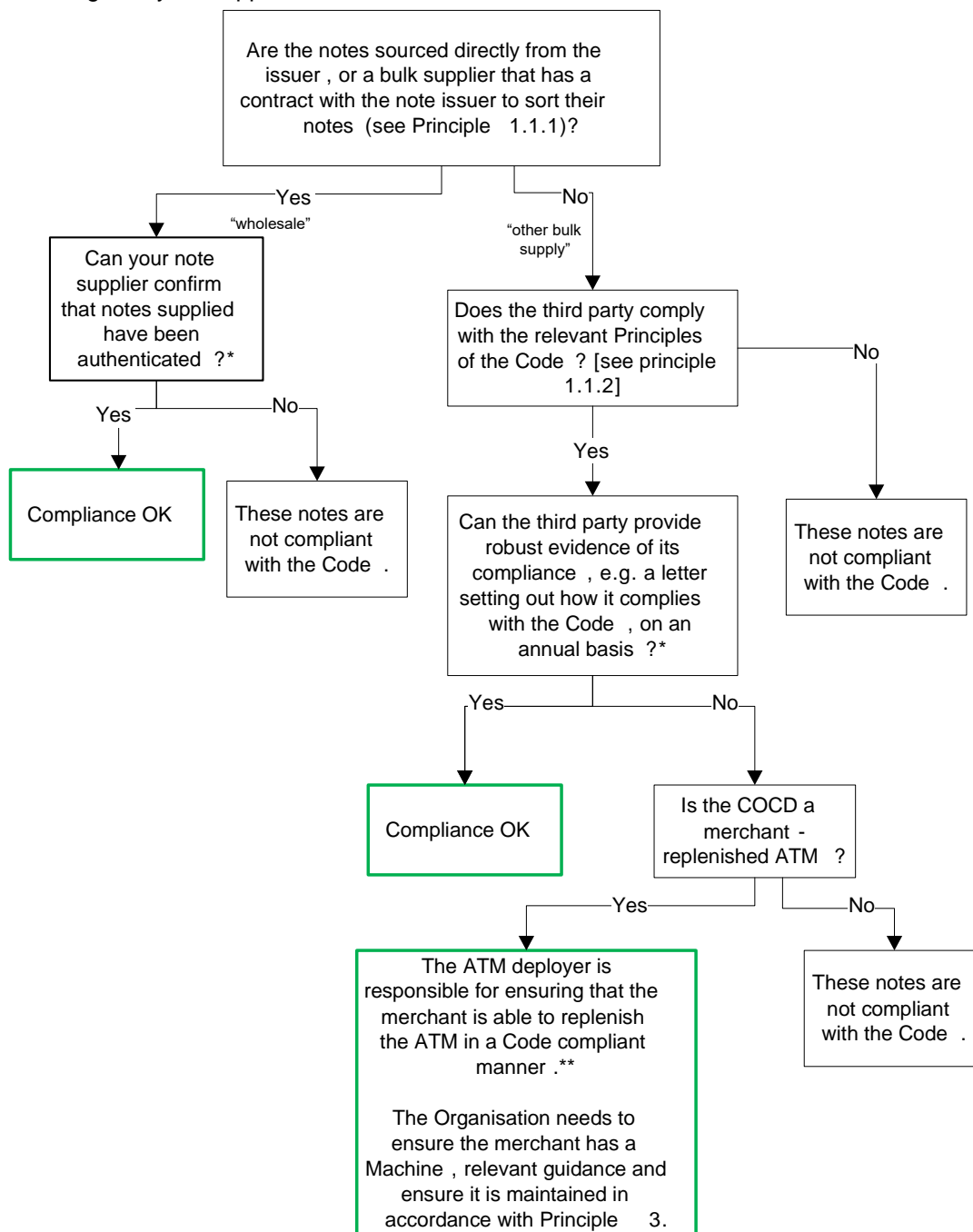
Recirculated banknotes should not be heavily soiled or worn and should be free from dye stains.

Appendix 2: Clarification of requirements for Code compliance



Appendix 3: Sourcing banknotes from a third party

If your organisation sources banknotes from a third party to dispense by COCD, the following decision tree should be of use when discussing with your supplier:



*If an incident occurs where a third-party supplier provides non-compliant notes despite these assurances, you should seek written assurance that a process change has occurred to prevent this occurring again.

**The merchant is a third-party supplier of cash to the ATM Operator (see Appendix 2).

NB: in any case of sourcing, responsibility remains with the Organisation, as set out in Principle 1.3. Further clarification is provided in Appendix 2.

Appendix 4: Compliance for ATMs connected to the LINK network

As specified in the LINK Operating Rules, LINK Scheme members are required to complete self-certification forms as part of their annual compliance attestation.¹⁸

Code Sponsors recommend that Network Members capture the following additional data in their annual attestation, in order to track the implementation of the Code:

- Number of ATMs operated which are in scope for Code compliance, as detailed on p.5 of this document;
- Number of ATMs complying primarily under the 'bulk supplier' (Principle 1.1) model, and in scope but not compliant;
- Number of ATMs complying primarily under the 'local' (Principle 1.2) model, and the number in scope but not compliant;
- For those primarily under the local model: number of site checks completed; of which compliant; of which noncompliant (mitigating action taken); or which non-compliant (no mitigating action).

Code Sponsors may engage with the Network Member at a senior level to discuss remedial actions required if it appears that the Member is not making progress towards Code compliance.

Relevant aggregate information, e.g. the number of ATMs in operation compliant with the Code, may be published and Code Sponsors reserve the right to publish a list of those Organisations which report their full compliance with the Code.

¹⁸ ATMs which are not LINK-connected should also comply with the Code and reporting arrangements are set out in appendix 5. If an alternative ATM network becomes significant in the UK, reporting on compliance with the Code would be required through that network on a similar basis.

Appendix 5: Compliance for operators of non-LINK ATMs and self-service checkouts

Compliance of self-service checkouts and ATMs outside the LINK network should be completed by self-certification. The certificate should be completed by the Organisation noted in the Scope (p.5). The following clarifications may be useful when completing the relevant form:

	Non-LINK ATMs*	Self-service checkouts
Machine provision and maintenance is the responsibility of:	The Organisation with the contractual relationship to the ATM settlement scheme.	The retailer.
Adequate guidance on Code compliance (e.g. in staff handbooks) should be provided by:	The Organisation with the contractual relationship to the ATM settlement scheme.	The retailer.
Review of compliance processes robustness should be completed by:	The audit or compliance function of the Organisation with the contractual relationship to the ATM settlement scheme.	The retailer's store audit function (internal auditor, store compliance team or similar).

Organisations operating non-LINK ATMs and/or self-service checkouts which dispense banknotes must report their compliance state annually. Code Sponsors will contact relevant organisations with a copy of that year's compliance form and request completion, usually by mid-year. The certificate should be completed and signed off at a senior level internally then sent to LocalRecycling@UKFinance.org.uk. The deadline for submissions will usually be by late summer.

Code Sponsors may engage with the Organisation at a senior level to discuss remedial actions required if it appears that the Organisation is not making progress towards Code compliance or is not reporting on their current compliance level according to the timetable set out above.

Relevant aggregate information, e.g. the number of COCDs in operation compliant with the Code, may be published and Code Sponsors reserve the right to publish a list of those Organisations which report their full compliance with the Code.

* Where a non-LINK ATM is operated by a LINK Network Member (i.e. where a portion of the Member's ATM estate is not connected to the LINK network), the Member should report on the compliance status of the non-LINK connected ATMs as an addendum to their annual LINK compliance attestation.

Appendix 6: Compliance for operators of other COCD types

Those Organisations operating a COCD which dispenses notes (e.g. as change or winnings) but which is not an ATM or a self-service checkout¹⁹, should ensure that their COCD complies with the Code. For these COCDs, there is currently no requirement for Organisations to certify compliance. This is due to the low level of dispense rates from other types of COCDs. Whilst there is no formal requirement to certify compliance for these types of COCD, it is still important that they comply with the Code.

Compliance self-certification for these COCDs may be added in the future, should the usage and aggregate values dispensed by such machines increase to a scale where this is warranted. Code Sponsors will monitor typical industry practices and scales of operation through regular contact with representative industry groups. Any move to introduce regular compliance reporting for any of these machines would first require a further public consultation.

¹⁹ For example, a vending or ticketing machine which dispenses notes as change, a foreign exchange machine which dispenses Bank of England or Scottish and Northern Ireland banknotes, a gaming machine which dispenses notes as winnings, or a machine which pays out notes as winnings against a 'ticket' or card used in, or issued by, other gaming machines.

Appendix 7: Process for future reviews of the Code

The Code is expected to evolve alongside cash handling practices and as new technologies emerge. Any meaningful change in the Code's requirements will entail a new consultation with affected stakeholders.

Feedback and questions on the operation of the Code are always welcome. They should be sent to LocalRecycling@UKFinance.org.uk. We will respond as soon as we can.

The Local Recycling Review Group, chaired by the Bank of England, will report on at least an annual basis on the level of uptake of the Code among stakeholders, feedback received, and suggested improvements that could be made

The Review Group currently consists of representatives of the Association of Commercial Banknote Issuers, the Bank of England, the British Retail Consortium, UK Finance Cash Services unit and LINK. Other representatives will be added to the Group as necessary to ensure appropriate stakeholder representation.

More information about the members of the Review Group can be found as follows:

Association of Commercial Banknote Issuers: <http://www.acbi.org.uk/>

Bank of England: <https://www.bankofengland.co.uk/banknotes>

British Retail Consortium: http://www.brc.org.uk/brc_home.asp

UK Finance: <https://www.ukfinance.org.uk/our-expertise/payments-and-innovation/payment-systems>

LINK: <http://www.link.co.uk>