



EUROPEAN CENTRAL BANK

RECYCLING OF EURO BANKNOTES: FRAMEWORK FOR THE DETECTION OF COUNTERFEITS AND FITNESS SORTING BY CREDIT INSTITUTIONS AND OTHER PROFESSIONAL CASH HANDLERS

I INTRODUCTION

I.1 RATIONALE FOR THE ESTABLISHMENT OF A COMMON FRAMEWORK FOR BANKNOTE RECYCLING

Article 106 (1) of the Treaty establishing the European Community and Article 16 of the ESCB Statute give the Eurosystem the **legal mandate** to issue euro banknotes. A primary task of **executing** this mandate is to ensure the **integrity** and **preservation** of euro **banknotes in circulation** and, by extension, the public's trust in euro banknotes. To attain these objectives, the condition (quality) of euro banknotes in circulation must be maintained at a good level so as to ensure that banknotes are accepted as a means of payment by the general public and can be readily used by banknote accepting devices. Moreover, only banknotes in good condition can be easily and reliably checked for genuineness. As banknotes inevitably deteriorate during circulation, **worn** or **defective banknotes** should be quickly **withdrawn** from circulation and **replaced** by new or fit banknotes. In addition, protecting the integrity of euro banknotes as a means of payment means that **counterfeit** euro banknotes need to be quickly **recognised** and immediately handed over to the competent national authorities to support investigations by the law enforcement agencies.

To ensure a smooth banknote supply and that the banknotes in circulation are of good quality, some national central banks (NCBs) had an agreement with the credit institutions that only **banknotes processed by NCBs should be issued by cash dispensers and automated teller machines** (hereafter collectively referred to as "ATMs"¹).

This strategy ensured that credit institutions would not re-issue counterfeits to their customers. In addition, it ensured a continuous **backflow** of **banknotes** to **NCBs** and, for the most part, enabled them to **control** the **quality** level of banknotes in circulation due to a sufficiently high return frequency of the circulating banknotes.

Article 6 of Council Regulation (EC) No 1338/2001 of 28 June 2001, which lays down measures necessary for the protection of the euro against counterfeiting, obliges credit institutions and any other institutions engaged in the sorting and distribution to the public of banknotes [and coins] as a professional activity, including establishments whose activity consists of exchanging banknotes of different currencies, such as bureaux de change (hereafter collectively referred to as "credit institutions and other professional cash handlers"), to withdraw from circulation all euro banknotes [and coins] received by them which they know or have sufficient reason to believe to be counterfeit, and to immediately hand them over to the competent national authorities. Moreover, Article 6 stipulates that Member States shall take the necessary measures to ensure that credit

¹ The term "**automated teller machine**" should cover in this framework all kinds of self-service (**customer-operated**) devices issuing banknotes, irrespective of other services offered (e.g. electronic bank transfers, printing of statements of account, etc.), except cash-recycling machines.

institutions and other professional cash handlers which fail to discharge the aforementioned obligation are subject to effective, proportionate and deterrent sanctions.

On 18 April 2002, the Governing Council adopted the Eurosystem's terms of reference for the use of cash-recycling machines and cash-in machines (ToR), which lay down guidance covering both the detection of counterfeits and minimum sorting standards for euro banknotes. In the wake of its implementation by the participating NCBs, credit institutions in countries where banknote recycling was previously prohibited by law or agreements with NCBs now have the possibility to provide their customers with banknotes processed internally by machines covered by the ToR, in addition to those ordered from NCBs.

Following the adoption of the ToR, some NCBs have taken measures in cooperation with the banking sector and the government, respectively, aiming at broadening the scope of the ToR. Frameworks have been set up providing for a further release of euro banknote recycling by credit institutions and other professional cash handlers on condition that the banknotes are duly checked for authenticity and fitness by banknote handling machines successfully tested by an NCB in compliance with the Eurosystem's common test procedures. As a result of the different national traditions regarding credit institutions' role in the cash cycle and the non-uniform implementation of the ToR at national level, there are now the following three models within the euro area:

1. credit institutions have to supply their customers only with banknotes received from the NCB.² Banknote recycling is only allowed by means of cash-recycling machines tested by the Eurosystem;
2. credit institutions have to supply their customers only with banknotes received from the NCB.² Banknote recycling is only allowed if banknotes are authenticated and fitness-checked by cash-recycling machines or other equipment successfully tested by the Eurosystem;
3. credit institutions are not bound by NCB regulations regarding banknote recycling, but are expected to cooperate with the NCB and follow its guidance.

The possibility of recycling euro banknotes enables credit institutions and other professional cash handlers to perform their role in the currency supply in a more effective and more cost-efficient manner. In order to avoid competitive distortions and to establish harmonised standards on banknote recycling within the euro area, the Eurosystem has agreed on a general framework to be applied for the entire euro area. The framework covers credit institutions and other professional cash handlers and lays down clear requirements for banknote recycling and, in particular, common rules for the detection of counterfeits and minimum standards for fitness checks of euro banknotes.

1.2 OBJECTIVES OF THIS FRAMEWORK

The principal objectives of this framework are, first, to provide credit institutions and professional cash handlers with assistance in complying with the obligations laid down in Article 6 of the Council Regulation (EC) No 1338/2001; second, to effectively implement a common policy regarding banknote recycling by credit institutions and other professional cash handlers in order to avoid competitive distortions within the euro area and to contribute to the

² Smaller cash transactions over the counter are normally excluded from this provision.

establishment of a single euro cash area; third, to recommend to credit institutions and other professional cash handlers the observance of due diligence **standards** concerning the handling of euro banknotes so as to contribute to maintaining the quality and genuineness of euro banknotes in circulation.

It should be noted that credit institutions and other professional cash handlers shall not be indemnified for any costs that may arise in connection with the implementation of this framework, or if the ECB or NCBs require(s) other measures to improve the quality of banknotes in circulation or decide(s) to issue euro banknotes with modified or new security features. Furthermore, the Eurosystem, having the authority concerning the issuance of euro banknotes, may at any time amend or repeal this framework or take other measures in order to ensure the integrity and preservation of euro banknotes in circulation.

2 FRAMEWORK FOR THE RECYCLING OF EURO BANKNOTES BY CREDIT INSTITUTIONS AND OTHER PROFESSIONAL CASH HANDLERS

This general framework is without prejudice to Council Regulation (EC) No 1338/2001, as well as national measures adopted by Member States pursuant to this Council Regulation, but it contributes to the smooth implementation of these measures in the Eurosystem's field of competence.

2.1 GENERAL REQUIREMENTS FOR BANKNOTE RECYCLING

2.1.1 DEFINITION OF BANKNOTE HANDLING MACHINES

The banknote handling machines used by credit institutions and other professional cash handlers for **recycling purposes** which are covered by this document shall fall into one of the following categories:

1. **Customer-operated** machines, for example cash-recycling machines and cash-in machines.
2. Machines **operated by staff members**. These staff-operated machines can be divided into (i) machines which check the **authenticity** and **fitness** of banknotes, i.e. banknote processing machines/banknote sorting machines, and (ii) machines which check **only** the **authenticity** of banknotes, i.e. banknote authentication machines. Whatever the type of staff-operated machine, they must all allow the processing of packages of banknotes, classify the individual banknotes either as genuine or suspect (rejected notes) without the intervention of the machine operator and physically sort and separate the suspect (rejected) banknotes from those classified as genuine euro banknotes.³

Future types of machine or other cash-handling equipment having the same functions and target groups as the aforementioned types of machine will have to comply with the general standards as set out below in order to be qualified for processing banknotes which can be re-issued by ATMs or other customer-operated devices.

³ The following banknote handling equipment is not covered by this document: (1) banknote authentication devices that require the user to decide whether a banknote is genuine or not; (2) banknote authentication devices which process single or batches of banknotes and classify, without the intervention of the user, the banknotes as genuine or suspect but do not physically separate the suspect banknotes from the genuine ones in an automated way; (3) staff-operated automated teller assistant devices (automatic till safes) which are used by teller staff of credit institutions as a day safe at the front end.

The aforementioned types of machine must be **adaptable** in order to ensure the reliable **detection** of **new counterfeits**. Moreover, the relevant types of machine must be **adaptable** to **more** or **less restrictive fitness standards**, respectively.

2.1.2 PRINCIPLES

Credit institutions and other professional cash handlers shall re-issue euro banknotes to customers only if these banknotes are duly checked for authenticity and fitness according to the criteria laid down by the ECB in this document and **possible complementary** arrangements that **NCBs** may adopt for implementing this framework. These complementary national arrangements shall not affect the level playing field, must be fully in line with the standards of this framework and will be **reported** periodically to the Eurosystem.

Credit institutions and other professional cash handlers shall furthermore comply with all the obligations laid down in Community or national counterfeit legislation.

The authenticity and fitness checks of the banknotes to be **recycled** shall be performed either by **banknote handling machines** successfully **tested** by **NCBs**, or by **trained staff** members.

Banknotes shall **only** be **returned** to **circulation** via **ATMs** or other customer-operated devices if they **have been checked for both authenticity and fitness** by **banknote handling machines** successfully **tested** by an **NCB**.

Banknotes which have been checked for **authenticity** by **trained staff** members, either manually or without the use of successfully tested banknote handling equipment, shall **not** be **returned** to circulation **via ATMs** or other customer-operated devices, but can only be re-issued **over the counter** after being **checked** for **fitness**.

Banknotes that are **not checked** for **authenticity** and **fitness** shall **not be re-issued** and shall be **returned** to the responsible **NCB** or its appointed agent(s).

2.1.3 EXCEPTIONS

a) Manual fitness checks of banknotes re-issued through ATMs or other customer-operated devices

In the case of **remote branches** of credit institutions with a **very low level** of **cash operations**, as an exception to the principles defined under paragraph 2.1.2, the fitness control of banknotes to be re-issued by ATMs or customer-operated devices can be performed by trained staff members, who are required to comply with the minimum sorting standard (manual fitness sorting) as laid down in the Annex to this document.⁴ The **authenticity** check shall be carried out by **banknote authentication machines successfully tested by an NCB**. Credit **institutions**, in close cooperation with NCBs, shall limit the volume of manually fitness-checked banknotes to **5%** of the overall **volume** of the respective **banknote denomination** that is recycled through **ATMs** and other customer-operated devices at **national** level.

b) Force majeure

In the case of *force majeure*, which shall be defined in accordance with the respective national legal system in which a credit institution or other professional cash handler has been

⁴ NCBs will circulate the Annex to credit institutions, other professional cash handlers and manufacturers of banknote handling machines upon request.

established and as a consequence of which the banknote supply is significantly impaired, credit institutions and other professional cash handlers may, in order to ensure a smooth banknote supply, exceptionally and temporarily have the authentication and fitness checks of banknotes performed by trained staff members in accordance with the requirements set out in this document. In such cases of *force majeure*, the respective credit institution or other professional cash handler shall without delay inform the relevant NCB about such manual authentication and fitness checks by trained staff members. This information shall be accompanied by details of the precise nature of the *force majeure* and the expected duration of the manual processing of euro banknotes.

2.1.4 OPERATION OF ATMs AND OTHER CUSTOMER-OPERATED DEVICES BY OTHER THIRD PARTIES

Other organisations, particularly retailers, whether or not they are addressed by Article 6 of the Council Regulation (EC) No 1338/2001, who operate self-service devices dispensing euro banknotes to the public (e.g. ATMs), are expected to duly check the banknotes for authenticity and fitness in accordance with the standards set out in this framework. The Eurosystem will follow developments in this area.

2.2 DETECTION OF COUNTERFEITS

Ensuring a high-level detection of counterfeits and preventing their re-issue is of paramount importance. Therefore, the banknote handling machines used for authenticating euro banknotes must be able to identify and to separate counterfeit euro banknotes from genuine ones in a reliable way. Credit institutions recycling euro banknotes over the counter shall ensure that these banknotes are authenticated at least by trained staff.

Counterfeit banknotes and banknotes suspected as counterfeits shall be immediately handed over to the competent authority as laid down by national arrangements consistent with Council Regulation (EC) No 1338/2001.

2.3 DETECTION OF UNFIT BANKNOTES

The fitness checks of the banknotes that should be re-issued shall be undertaken in accordance with the Eurosystem's common minimum sorting standards which are set out in the Annex to this document and which form an integral part of this framework. Unfit banknotes have to be returned to the NCB. As the two lowest denominations (€5 and €10) are generally subject to higher wear and tear in circulation, it is recommended that these denominations are regularly dispensed to retailers and the general public to ensure a good quality of banknotes in circulation.

The individual criteria for fitness sorting are set in an effort to maintain the quality of euro banknotes in circulation in the euro area countries. The ECB can revise these standards to achieve this objective.

In order to ensure a smooth functioning of the cash cycle and that banknotes of good quality are in circulation, NCBs monitor the evolution of the quality level of euro banknotes in circulation within their jurisdiction. In the case of a deterioration in the quality level of the circulating banknotes of individual denominations, NCBs, after informing the ECB, may give guidance on adjusting the settings of the fitness detector systems.

2.4 CLASSIFICATION AND TREATMENT OF EURO BANKNOTES PROCESSED BY BANKNOTE HANDLING MACHINERY

2.4.1 CUSTOMER-OPERATED MACHINES

In the case of **customer-operated machines**, the deposited banknotes must be classified according to one of the following categories. Machines which do not check deposited banknotes for fitness and do not recycle fit banknotes, for example cash-in machines, do not need to distinguish between category 4a and category 4b.

Table 1 Classification of banknotes by customer-operated machines and subsequent treatment

Category	Classification	Properties	Treatment
1	Not a banknote, not recognised as euro banknote.	Not detected as a banknote because of: <ul style="list-style-type: none"> – Wrong image and format; – Transportation error (e.g. double feeds, etc.); – Large dog-ears or missing parts; – Hand-drafted banknotes, separating cards, etc.; or – Non-euro currency 	Return to customer.
2	Objects identified as suspect counterfeit euro banknotes ¹⁾	Image and format recognised, but one or more authentication features missing or clearly out of tolerance.	To be withdrawn from circulation. To be handed over for authentication – together with information on the account holder – to the competent national authorities as soon as possible, in line with national regulations, at the latest 20 working days after deposit in a machine. Not to be credited to account holder.
3	Euro banknotes not clearly authenticated.	Image and format recognised, but not all authentication features recognised because of quality and/or tolerance deviations. In most cases damaged or soiled banknotes.	The banknotes have to be processed separately and transported to the competent national authorities for authentication as soon as possible, in line with national regulations, at the latest 20 working days after deposit in a machine. ²⁾ The information on the account holder has to be stored for eight weeks after the banknotes have been detected by the machine. This information shall be made available on request. Alternatively, in agreement with the competent national authorities, the information allowing the traceability of the account holder can be handed over together with the category 3 banknotes to the authorities. May be credited to account holder.
4a	Euro banknotes identified as genuine and fit.	All authentication and fitness checks supported by the machine delivered positive results.	Can be used for recycling. To be credited to account holder.
4b	Euro banknotes identified as genuine and unfit.	All authentication checks supported by the machine delivered positive results. Fitness checks supported by the machine delivered negative results.	Shall not be used for recycling and shall be returned to the NCB. To be credited to account holder.

1) As a rule, this category 2 will comprise most of the banknotes received by professional cash handlers “which they know or have sufficient reason to believe to be counterfeit” in the sense of Article 6 of the Council Regulation (EC) No 1338/2001. The final decision on the genuineness of euro banknotes is made by an NCB.

2) If category 3 banknotes are not physically separated from category 4a and 4b banknotes, all banknotes are to be treated as category 3 banknotes, and thus are to be returned to the competent national authorities.

Registration and identification of (i) category 2 and 3 banknotes/counterfeits and (ii) the respective account holder is necessary to ensure re-traceability and thus enhance the level of security. To enable counterfeits which have been identified amongst category 3 banknotes by an NCB to be retraced to the account holder, banknote identification features together with the customer identification have to be stored for a minimum of eight weeks after the banknotes have been detected by the machine if the information is not handed over to the competent national authorities together with the category 3 banknotes.

Video surveillance is recommended by the police forces and could provide additional security against criminal offences. Video surveillance is subject to the applicable national legislation.

2.4.2 STAFF-OPERATED MACHINES

Staff-operated machines must classify the banknotes either as suspect or as genuine. The genuine banknotes should be checked for fitness and unfit banknotes should be separated from the fit ones.

Table 2 Classification of banknotes by staff-operated machines and subsequent treatment

Category	Classification	Properties	Treatment
A	(i) Objects not recognised as euro banknotes or (ii) suspect counterfeit euro banknotes.	Objects not detected as banknotes because of: <ul style="list-style-type: none"> – Transportation error (e.g. double feeds, etc.); – Wrong image and format; – Large dog-ears or missing parts; – Hand-drafted notes, separating cards, etc.; – Non-euro currency; – Image and format recognised, but one or more authentication features missing or clearly out of tolerance; or – Image and format recognised, but not all authentication features recognised because of quality and/or tolerance deviations. In most cases unfit or soiled banknotes.	(i) Objects not recognised as euro banknotes: e.g. blank paper, other currencies and cheques. After visual evaluation by staff member these objects should be separated from the suspect euro banknotes. (ii) All other objects, i.e. suspect euro banknotes, have to be processed separately and transported to the competent national authorities for authentication as soon as possible, in line with national regulations, but in any case within 20 working days of depositing these banknotes.
B 1	Banknotes identified as genuine and fit.	All authentication checks and fitness checks supported by the machine delivered positive results.	Can be used for recycling. To be credited to account holder.
B 2	Banknotes identified as genuine and unfit.	All authentication checks supported by the machine delivered positive results. Fitness checks supported by the machine delivered negative results.	Shall not be used for recycling and shall be returned to the NCB. To be credited to account holder.

2.5 INFORMATION ON THE EURO BANKNOTES AND THEIR SECURITY FEATURES

Information on the euro banknotes and their security features was provided to the relevant market participants in the framework of the euro test runs in 2000 and 2001. In this respect, the Eurosystem will also cooperate with the relevant third parties in the future. The Eurosystem will inform the credit institutions and other professional cash handlers about the issuance of euro banknotes with modified or new security features early enough to allow timely preparation of the handling of the new euro banknotes.

2.6 COMMON NCB TESTS FOR BANKNOTE HANDLING MACHINERY USED FOR RECYCLING PURPOSES

In accordance with this framework, recycling of euro banknotes processed by banknote handling machinery, as defined in paragraph 2.1.1, requires the use of machines whose manufacturers have proven that their equipment complies with the requirements set out in this document. To this end, NCBs offer manufacturers common tests for detector systems and banknote handling machines with a broad selection of topical euro counterfeits and genuine fit and unfit euro banknotes at appropriate locations. These tests as well as their results are valid throughout the euro area. Any type of customer-operated or staff-operated machine successfully tested by an NCB according to the Eurosystem's common test procedures can be used throughout the euro area, in line with national regulations/law and without re-testing by other NCBs. The Eurosystem publishes on the ECB/NCB websites a list of customer-operated and staff-operated machines, as defined under paragraph 2.1.1, which have passed the common test procedures at an NCB. If a successfully tested type of machine does not pass a re-test by an NCB, the machine will be removed from the ECB/NCB websites. Credit institutions or other professional cash handlers which install such machines shall notify the respective NCB(s) of the use of the machines prior to putting them into operation.

NCBs will not issue to the manufacturers or other third parties any certification of the machines upon completion of a successful test. However, if a machine has successfully been tested by an NCB, a summary test report can be issued.

A test is only valid for the tested counterfeits. The Eurosystem does not bear any formal responsibility in the event that the machines successfully tested by NCBs do not comply with the requirements of this framework. It is therefore the responsibility of the credit institutions and other professional cash handlers, in cooperation with the manufacturers, to update their machines by installing the latest version of the updated authentication hardware and/or software on the machines, as obtainable from the respective manufacturers. The Eurosystem will establish procedures to assist the relevant third parties (manufacturers and machine operators) in their efforts to update their products in good time and to inform the credit sector on topical counterfeits with imitations of machine-readable security features. Credit institutions and other professional cash handlers shall require manufacturers, after any update of the authentication hardware and/or software, to have the respective type of machine re-tested by an NCB.

Manufacturers are requested to provide NCBs with relevant information on how the machines can be adapted to detect new counterfeits and/or more restrictive or less restrictive fitness standards, respectively, (i) only if software modifications are required, (ii) if software and hardware modifications are required. This information shall be covered by a non-disclosure agreement to be concluded between the parties involved.

2.7 MONITORING BY NCBs

Credit institutions and other professional cash handlers shall regularly provide NCBs with the following information with a view to enabling the Eurosystem to monitor compliance with this framework:

- general information on recycling and cash centres;

- **statistics** on the volume of cash operations;
- **information** on **machines** used for **recycling** purposes and **ATMs**; and on
- **remote bank branches** with a very low level of cash operations, where fitness checks are carried out **manually**.

The **Eurosystem** will **define** the **details** of the **information** to be **provided**, in consultation with the banking sector, in the **first half of 2005**.

Credit institutions and other professional cash handlers shall allow **NCBs** to carry out system **checks** of machines in operation in order to **verify** the **authenticity** detection and **fitness detection** (if applicable) as well as the **traceability** of transactions (customer-operated machines). In the course of these checks, NCBs may also verify the arrangements governing the operation of these machines and the subsequent handling of the processed banknotes as well as, on a sample basis, the fitness sorting carried out by trained staff. If an NCB ascertains any contravention during the inspections, the credit institutions or other professional cash handlers shall take the required measures so as to ensure compliance with the requirements of this framework as soon as possible. Where system checks reveal that a certain type of banknote handling machine does not detect all topical counterfeits, the respective institution shall update all its relevant machines without delay. In addition, the Eurosystem will arrange with the manufacturers for information on available updates of those machines to be provided to all of their customers.

3 IMPLEMENTATION

NCBs will implement this framework at national level as soon as possible, at the latest by the end of 2006. Until the implementation of this framework by NCBs, the existing national regulations/arrangements remain applicable and the NCBs' relationships with their national professional cash handlers will remain in place. As of the implementation of this framework at the national level, there will be a transition period of two years for the adaptation of procedures and existing machines in operation by credit institutions and other professional cash handlers. However, this transition period will expire at the end of 2007 at the latest. Where credit institutions and other professional cash handlers decide against the recycling of banknotes, they will continue to have the option of having their euro banknote requirements met by NCBs, as defined by each NCB.

This framework will replace the Eurosystem's terms of reference for the use of cash-recycling machines and cash-in machines, as adopted by the Governing Council on 18 April 2002, without affecting the current contractual relationships in place concerning these machines.

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