INTERNATIONAL STANDARD

ISO 10126-2

First edition
1991-07-15

Banking - Procedures for message encipherment (wholesale) —

Part 2:
DEA algorithm

Banque — Procédures de chiffrement de messages (service aux entreprises) —

Partie 2: Algorithme DEA

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/cc00cc3e-336a-4736-b2b0-44c51ff2da8/iso-10126-2-1991

Reference number
ISO 10126-2:1991(E)

Contents

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/cc00cc3e-336a-4736-b2b0-44c51f1f2da8/iso-10126-2-1991

© ISO 1991
All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

International Standard ISO 10126-2 was prepared by Technical Committee ISO/TC 68, *Banking and related financial services*.

ISO 10126 consists of the following parts, under the general title *Banking - Procedures for message encipherment (wholesale)*:

ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/cc00cc3e-33e8-4750-b2b0-44c51f1f2da8/iso-10126-2-1991

— *Part 1: General principles*

— *Part 2: DEA algorithm*

ISO 10126 originates from work done in ANSI, and is a development of (while remaining compatible with) ANSI X9.23 (1988), *Financial Institution: Encryption of Wholesale Financial Messages*.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This page intentionally left blank

ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/cc00cc3e-336a-4736-b2b0-44c51f1f2da8/iso-10126-2-1991

Banking - Procedures for message encipherment (wholesale) —

Part 2:
DEA algorithm

1 Scope

ISO 10126-1 specifies a method for the encipherment and decipherment of entire (or part of) wholesale financial messages by the use of application level encipherment, for the purpose of providing confidentiality.

DEA may be used as a suitable algorithm to implement ISO 10126-1. It is specified in ANSI X3.92. Keys shall be managed in accordance with ISO 8732.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10126. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10126 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 8372:1987, *Information processing — Modes of operation for a 64-bit block cipher algorithm.*

ISO 8732:1988, *Banking — Key management (wholesale).*

ISO 10126-1:1991[1], *Banking — Procedures for message encipherment (wholesale) — Part 1: General principles.*

ANSI X3.92:1981, *American National Standard for information Systems — Data Encryption Algorithm.*

3 Modes of operation

The modes of operation that shall be used are Cipher Block Chaining (CBC), One Bit Cipher Feedback (CFB-1) or Eight Bit Cipher Feedback (CFB-8) as defined in ISO 8732.

4 Initialization Vectors (IVs)

An IV is used as a starting point for the encipherment and decipherment of a data sequence to increase security by introducing additional cryptographic variance (i.e. a repeated plaintext sequence will not result in a repeated ciphertext sequence) and to synchronize cryptographic equipment.

4.1 Cipher Block Chaining (CBC)

A new random, pseudo-randon or non-repeating 64-bit IV shall be used for each cryptoperiod. The same IV may be used within the cryptoperiod of the associated key.

4.2 Cipher Feedback (CFB)

A new random, pseudo-random, or non-repeating 48- or 64-bit IV shall be used for each message.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/cc00cc5e-336a-4736-b2b0-44c51f1f2da8/iso-10126-2-1991

[1] To be published.

5 Initial Text Sequence (ITS)

In the case of CBC, if the IV is not changed for each message, then a new random, pseudo-random, or non-repeating 64-bit Initial Text Sequence (ITS) shall immediately precede the message data to be protected. If a new random, pseudo-random, or non-repeating IV is used for each message, then no ITS is required.

6 Padding field (CBC mode only)

Padding shall be present in every CBC message. Plaintext shall be padded to a multiple of 64 bits before encipherment using the CBC mode. Padding shall be performed using either bits or octets by appending a padding field to the end of the plaintext (as shown cross-hatched in figure 1). After decipherment, the padding field shall be discarded.

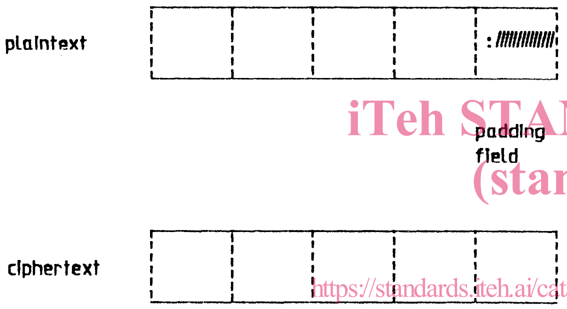
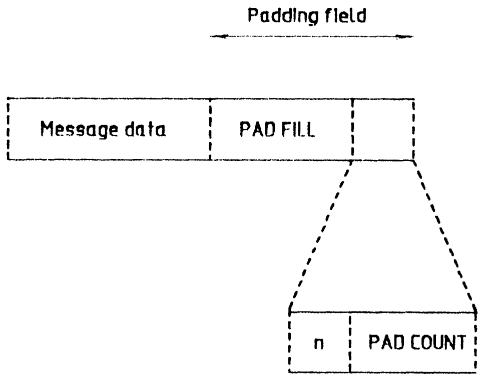


Figure 1 — Message padding

When padding with bits, the padding field shall consist of 8 to 71 bits divided into two subfields (see figure 2). The first subfield (pad fill) shall consist of 0 to 63 bits with arbitrary contents. The second subfield (pad count) shall consist of 8 bits containing the number of bits in the padding field, in the range of 8 to 71. The left-most bit of the pad count shall indicate that the pad count is given in bits (value of 1). The remaining bits of the pad count shall contain an unsigned binary number. That number shall be the total number of bits in the padding field. See table 1 for further information on padding with bits (CBC mode only).



NOTE – When n = 1, pad count in bits; when n = 0, pad count in octets.

Figure 2 — Padding field format

When padding with octets, the padding field shall consist of 1 to 8 octets divided into two subfields (see figure 2). The first subfield (pad fill) shall consist of 0 to 7 octets with arbitrary contents. The second subfield (pad count) shall consist of one octet containing the number of octets in the padding field in the range of 1 to 8. The left-most bit of the pad count shall indicate that the pad count is given in octets (value of 0). The remaining bits of the pad count shall contain an unsigned binary number. That number shall be the total number of padding octets in the padding field. See table 2 for further information on padding with octets (CBC mode only).

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/ec08cc3e-336a-4736-b2b0-44c51f1f2da8/iso-10126-2-1991

Table 1 — Padding with bits (CBC mode only)

Number of bits in last plaintext block	Number of bits in pad fill	Number of bits in padding field	Pad count (8 bits)
64	56	64	11000000
63	57	65	11000001
62	58	66	11000010
.	.	.	.
.	.	.	.
.	.	.	.
58	62	70	11000110
57	63	71	11000111
56	0	8	10001000
55	1	9	10001001
54	2	10	10001010
.	.	.	.
.	.	.	.
.	.	.	.
2	54	62	10111110
1	55	63	10111111

Table 2 — Padding with octets (CBC mode only)

Number of octets in last plaintext block	Number of octets in pad fill	Number of octets in padding field	Pad count (8 bits)
8	7	8	00001000
7	0	1	00000001
6	1	2	00000010
5	2	3	00000011
4	3	4	00000100
3	4	5	00000101
2	5	6	00000110
1	6	7	00000111

iTeh STANDARD PREVIEW
(standards.iteh.ai)
ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/cc00cc3e-336a-4736-b2b0-44c51f1f2da8/iso-10126-2-1991

7 Independent encipherment and decipherment of encipherment elements

See ISO 10126-1:1991, 5.3, method 1.

The IV used to encipher the *n*th encipherment element shall be formed by modulo-2 adding the IV and the right justified unsigned binary value of n: IVn = IV + n. For the first encipherment, element n shall have the value 1.

In the case of CBC, if the IV is not changed for each message, then a new random, pseudo-random, or non-repeating ITS shall appear at the beginning of each encipherment element.

In the case of CBC, each encipherment element shall be padded before encipherment in accordance with clause 6.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 10126-2:1991
https://standards.iteh.ai/catalog/standards/sist/cc00cc3e-336a-4736-b2b0-44c51f1f2da8/iso-10126-2-1991

UDC 336.719.2:355.405.2:681.3.04

Descriptors: banking, messages, protection of information, coded representation, algorithms.

Price based on 3 pages