ETSI TS 119 144-2 V2.1.1 (2016-06)

TECHNICAL SPECIFICATION

**Electronic Signatures and Infrastructures (ESI);
PAdES digital signatures -
Testing Conformance and Interoperability;
Part 2: Test suites for testing interoperability of
PAdES baseline signatures**

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:
http://www.etsi.org/standards-search

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or
print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any
existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the
print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status.
Information on the current status of this and other ETSI documents is available at
https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx

If you find errors in the present document, please send your comment to one of the following services:
https://portal.etsi.org/People/CommiteeSupportStaff.aspx

Copyright Notification

ETSI

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Electronic Signatures and Infrastructures (ESI).

The present document is part 2 of a multi-part deliverable covering PAdES digital signatures - Testing Conformance and Interoperability. Full details of the entire series can be found in part 1 [i.1].

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document defines a number of test suites to assess the interoperability between implementations claiming conformance to PAdES baseline signatures [2].

The test suites are defined with four different layers reflecting the four different levels of PAdES baseline signatures:

- Tests suite addressing interoperability between applications claiming B-B level conformance.

- Tests suite addressing interoperability between applications claiming B-T level conformance.

- Tests suite addressing interoperability between applications claiming B-LT level conformance.

- Tests suite addressing interoperability between applications claiming B-LTA level conformance.

Test suites also cover augmentation of PAdES baseline signatures and negative test cases.

These test suites are agnostic of the PKI infrastructure. Any PKI infrastructure can be used including the one based on EU Member States Trusted Lists.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI EN 319 122-1: "Electronic Signatures and Infrastructures (ESI); CAdES digital signatures; Part 1: Building blocks and CAdES baseline signatures".

[2] ETSI EN 319 142-1: "Electronic Signatures and Infrastructures (ESI); PAdES digital signatures; Part 1: Building blocks and PAdES baseline signatures".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI TR 119 144-1: "Electronic Signatures and Infrastructures (ESI); PAdES digital signatures - Testing Conformance and Interoperability; Part 1: Overview".

[i.2] ETSI TR 119 001: "Electronic Signatures and Infrastructures (ESI); The framework for standardization of signatures; Definitions and abbreviations".

[i.3]   ETSI EN 319 102-1: "Electronic Signatures and Infrastructures (ESI); Procedures for Creation and Validation of AdES Digital Signatures; Part 1: Creation and Validation".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in ETSI TR 119 001 [i.2] and the following apply:

negative test case: test case for a signature whose validation according to ETSI EN 319 102-1 [i.3] would not result in TOTAL-PASSED

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TR 119 001 [i.2] apply.

4   Overview

This clause describes the overall approach used throughout the present document to specify test suites for PAdES baseline signatures interoperability testing.

ETSI EN 319 142-1 [2] defines four different levels of PAdES baseline signatures.

The test suites are defined with different layers reflecting the levels of PAdES baseline signatures specified in ETSI EN 319 142-1 [2]:

- Testing PAdES signatures interoperability between applications claiming B-B level conformance.

- Testing PAdES signatures interoperability between applications claiming B-T level conformance.

- Testing PAdES signatures interoperability between applications claiming B-LT level conformance.

- Testing PAdES signatures interoperability between applications claiming B-LTA level conformance.

- Testing augmentation of PAdES signatures from B-T level to B-LTA level.

- Negative test cases for PAdES baseline signatures:

    - PAdES-B-B signatures test cases.

    - PAdES-B-T signatures test cases.

    - PAdES-B-LTA signatures test cases.

5   Testing interoperability of PAdES-B-B signatures

The test cases in this clause have been defined for different combinations of PAdES-B-B signatures attributes.

Mandatory attributes for PAdES-B-B signatures described in ETSI EN 319 142-1 [2], clauses 6.2 and 6.3, shall be present.

Table 1 shows which attributes are required to generate PAdES-B-B signatures for each test case.

Table 1: Test cases for PAdES-B-B signatures

TC ID	Description	Pass criteria	Signature attributes

PAdES/BB/1	This is the simplest PAdES-B-B signatures interoperability test case. The signature ONLY CONTAINS the mandatory PAdES attributes.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, ESSSigningCertificateV2 and MessageDigest attributes.	• SignatureDictionary
			  o Type
			    o Sig
			  o Filter
			    o Adobe.PPKLite
			  o SubFilter
			    o ETSI.CAdES.detached
			  o M
			  o ByteRange
			  o Contents (DER CMS)
			    o Certificates SigningCertificate
			    o ContentType
			    o MessageDigest
			    o ESSSigningCertificateV2

PAdES/BB/2	In this PAdES-B-B signatures interoperability test case the signature dictionary contains the same entries used in test case PAdES/BB/1 with the addition of Location, ContactInfo and Reason entries. ContentType, ESSSigningCertificateV2 and MessageDigest attributes shall be added to the PDF signature included in the Contents entry as specified in CAdES [1].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M, Location, Reason and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, ESSSigningCertificateV2 and MessageDigest attributes.	• SignatureDictionary
			  o Type
			    o Sig
			  o Filter
			    o Adobe.PPKLite
			  o SubFilter
			    o ETSI.CAdES.detached
			  o M
			  o Location
			  o ContactInfo
			  o Reason
			  o ByteRange
			  o Contents (DER CMS)
			    o Certificates SigningCertificate
			    o ContentType
			    o MessageDigest
			    o ESSSigningCertificateV2

PAdES/BB/3	In this PAdES-B-B signatures interoperability test case the PDF signature contains ContentTimeStamp attribute in addition to ContentType, ESSSigningCertificateV2 and MessageDigest attributes included to the PDF signature included in the Contents entry as specified in CAdES [1].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, ESSSigningCertificateV2, ContentTimeStamp and MessageDigest attributes.	• SignatureDictionary
			  o Type
			    o Sig
			  o Filter
			    o Adobe.PPKLite
			  o SubFilter
			    o ETSI.CAdES.detached
			  o M
			  o ByteRange
			  o Contents (DER CMS)
			    o Certificates SigningCertificate
			    o ContentType
			    o MessageDigest
			    o ESSSigningCertificateV2
			    o ContentTimeStamp

TC ID	Description	Pass criteria	Signature attributes

PAdES/BB/4	This test case tests a PAdES-B-B signature with an instance of ClaimedAttribute of SignerAttributesV2 attribute. ContentType, ESSSigningCertificateV2, MessageDigest and SignatureTimeStamp attributes shall also be added to the PDF signature included in the Contents entry as specified in CAdES [1].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, M, SubFilter and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, ClaimedAttribute (included in SignerAttributesV2), ESSSigningCertificateV2, MessageDigest attributes.	• SignatureDictionary
			o Type
			  o Sig
			o Filter
			  o Adobe.PPKLite
			o SubFilter
			  o ETSI.CAdES.detached
			o M
			o ByteRange
			o Contents (DER CMS)
			  o Certificates SigningCertificate
			  o ContentType
			  o MessageDigest
			  o ESSSigningCertificateV2
			  o SignerAttributesV2 ClaimedAttribute

PAdES/BB/5	This test case tests a PAdES-B-B signature with an instance of CertifiedAttributeV2 of SignerAttributesV2 attribute. ContentType, ESSSigningCertificateV2, MessageDigest and SignatureTimeStamp attributes shall also be added to the PDF signature included in the Contents entry as specified in CAdES [1].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, M, SubFilter and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, CertifiedAttributesV2 (included in SignerAttributesV2), ESSSigningCertificateV2, MessageDigest attributes.	• SignatureDictionary
			o Type
			  o Sig
			o Filter
			  o Adobe.PPKLite
			o SubFilter
			  o ETSI.CAdES.detached
			o M
			o ByteRange
			o Contents (DER CMS)
			  o Certificates SigningCertificate
			  o ContentType
			  o MessageDigest
			  o ESSSigningCertificateV2
			  o SignerAttributesV2 CertifiedAttributeV2

PAdES/BB/6	This test case tests a PAdES-B-B signature with M, Reason, and Location entries in signature dictionary and MessageDigest, SignaturePolicyIdentifier, ContentType and ESSSigningCertificateV2 attributes in the CAdES [1] signature included in the Contents entry.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M, Reason, Location and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, ESSSigningCertificateV2, SignaturePolicyIdentifier and MessageDigest attributes.	• SignatureDictionary
			o Type
			  o Sig
			o Filter
			  o Adobe.PPKLite
			o SubFilter
			  o ETSI.CAdES.detached
			o Reason
			o Location
			o M
			o ByteRange
			o Contents (DER CMS)
			  o SigningCertificate
			  o ContentType
			  o MessageDigest
			  o ESSSigningCertificateV2
			  o SignaturePolicyIdentifier

TC ID	Description	Pass criteria	Signature attributes

PAdES/BB/7	This test case tests a PAdES-B-B signature in which digest algorithm SHA1 is used to digest data to be signed. The signature ONLY CONTAINS the mandatory PAdES properties.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, ESSSigningCertificate and MessageDigest attributes	• SignatureDictionary
			  o Type
			    o Sig
			  o Filter
			    o Adobe.PPKLite
			  o SubFilter
			    o ETSI.CAdES.detached
			  o M
			  o ByteRange
			  o Contents (DER CMS)
			    o Certificates SigningCertificate
			    o ContentType
			    o MessageDigest
			    o ESSSigningCertificate

6   Testing interoperability of PAdES-B-T signatures

The test cases in this clause have been defined for different combinations of PAdES-B-T signatures attributes. PAdES baseline signatures claiming conformance to B-T level of ETSI EN 319 142-1 [2] shall be built on baseline signatures conformant to B-B level.

A PAdES baseline signature conformant to B-T level shall be a baseline signature conformant to B-B level for which a Trust Service Provider has generated a trusted token (time-stamp token) proving that the signature itself actually existed at a certain date and time.

Mandatory attributes for PAdES-B-T signatures described in ETSI EN 319 142-1 [2], clauses 6.2 and 6.3, shall be present.

Table 2 shows which attributes are required to generate PAdES-B-T signatures for each test case.

Table 2: Test cases for PAdES-B-T signatures

TC ID	Description	Pass criteria	Signature attributes

PAdES/BT/1	This is the simplest PAdES-B-T signatures interoperability test case with M entry in signature dictionary. ContentType, ESSSigningCertificateV2, MessageDigest and SignatureTimeStamp attributes shall be added to the PDF signature included in the Contents entry as specified in CAdES [1].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, M, SubFilter and ByteRange entries. The DER-encoded CMS binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field) attribute, ContentType, ESSSigningCertificateV2, MessageDigest signed attributes and SignatureTimeStamp unsigned attribute.	• SignatureDictionary
			  o Type
			    o Sig
			  o Filter
			    o Adobe.PPKLite
			  o SubFilter
			    o ETSI.CAdES.detached
			  o M
			  o ByteRange
			  o Contents (DER CMS)
			    o Certificates SigningCertificate
			    o ContentType
			    o MessageDigest
			    o ESSSigningCertificateV2
			    o SignatureTimeStamp