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Electronic Signatures and Infrastructures (ESI);
PAdES digital signatures -
Testing Conformance and Interoperability;
Part 3: Test suites for testing interoperability of additional PAdES signatures

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Foreword

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

The present document is part 3 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).

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1 Scope

The present document defines a number of test suites to assess the interoperability between implementations claiming conformance to additional PAdES signatures profiles [3].

The present document defines test suites for each profile defined in ETSI EN 319 142-2 [3].

Test suites also cover augmentation of additional PAdES 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] ISO 32000-1: "Document management - Portable document format - Part 1: PDF 1.7".

NOTE: Available at http://www.adobe.com/devnet/acrobat/pdfs/PDF32000_2008.pdf.

[2] ETSI EN 319 132-1: "Electronic Signatures and Infrastructures (ESI); XAdES digital signatures; Part 1: Building blocks and XAdES baseline signatures".

[3] ETSI EN 319 142-2: " Electronic Signatures and Infrastructures (ESI); PAdES digital signatures; Part 2: Additional PAdES signatures profiles".

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

[5] IETF RFC 6960: "X.509 Internet Public Key Infrastructure Online Certificate Status Protocol - OCSP".

[6] IETF RFC 5280 (2008): "Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile".

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] and the following apply:

XFA XML Forms Architecture

4 Testing CMS digital signatures in PDF interoperability

4.1 Introduction

This clause refers to clause 4 of ETSI EN 319 142-2 [3]. The test cases in this clause have been defined for different combinations of CMS digital signatures in PDF attributes. They test the use of PDF signatures, as described in ISO 32000-1 [1] and based on CMS.

Mandatory attributes for CMS digital signatures in PDF described in ETSI EN 319 142-2 [3], clause 4.2, shall be present.

4.2 Testing CMS digital signatures in PDF

The test cases in this clause have been defined for different combinations of CMS/PDF attributes but the following minimum requirements shall be satisfied.

Mandatory attributes for CMS digital signatures in PDF described in ETSI EN 319 142-2 [3], clause 4, shall be present.

Table 1 shows which attributes are required to generate CMS digital signatures in PDF for each test case.

Table 1: Test cases for CMS digital signatures in PDF

TC ID	Description	Pass criteria	Signature attributes
PAdES/CMS/1	This is the simplest CMS digital signatures in PDF with minimum requirements and signature dictionary entry M (signing time). The signature shall be an approval signature as defined in ISO 32000-1 [1].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType and SignerInfo attributes.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o M o ByteRange o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo
PAdES/CMS/2	This test case tests a CMS digital signature in PDF with signature time stamp attribute which ensures the time of signing, Location attribute which describes where the data was signed (CPU host name or physical location), Reason attribute that describes the reason for the signing, ContactInfo attribute that provides information to enable a recipient to contact the signer to verify the signature.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, Reason, Location, ContactInfo and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, SignerInfo and SignatureTimestamp attributes.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o Reason o Location o ContactInfo o ByteRange o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo o SignatureTS
PAdES/CMS/3	This test case tests a CMS digital signature in PDF with signature time stamp attribute which ensures the time of signing and adbe Revocation Information attribute to ensure revocation checks for the signing certificate and its issuer certificates. Certificate revocation list, described in IETF RFC 5280 [6] shall be used.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, SignerInfo, SignatureTimestamp and RevocationInfo attributes.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o ByteRange o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo o SignatureTS o RevocationInfo ▪ Crls

TC ID	Description	Pass criteria	Signature attributes
PAdES/CMS/4	This test case tests a CMS digital signature in PDF with signature time stamp attribute which ensures the time of signing and adbe Revocation Information attribute to ensure revocation checks for the signer's certificate and its issuer certificates. OCSP responses, described in IETF RFC 6960 [5] shall be used.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType, SignerInfo, SignatureTimestamp and RevocationInfo attributes.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o ByteRange o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo o SignatureTS o RevocationInfo ▪ OCSP resp
PAdES/CMS/5	This test case tests a CMS serial digital signature in PDF. The signed document shall include 2 serial signatures.	Positive validation. The signed document shall contain 2 serial signatures. The signature dictionary of every signature shall contain Type, Contents, Filter, SubFilter, M and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType and SignerInfo attributes.	• SignatureDictionary (2 entries) o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o ByteRange o M o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo
PAdES/CMS/6	This test case tests a CMS certification digital signature in PDF with signing time and LegalContentAttestation attributes.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M, Reference and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType and SignerInfo attributes. The attestation entry in the LegalAttestationDictionary shall be valued.	• LegalAttestationDictionary • SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o ByteRange o M o Reference o DocMDP o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo

5 Testing interoperability of PAdES-E-BES and PAdES-E-EPES signatures

5.1 Introduction

This clause refers to clauses 5.3 of ETSI EN 319 142-2 [3]. The test cases in this clause have been defined for different combinations of PAdES-E-BES and PAdES-E-EPES signatures attributes.

Mandatory attributes for PAdES-E-BES and PAdES-E-EPES signatures described in ETSI EN 319 142-2 [3], clauses 5.2, 5.3 and 5.4, shall be present.

5.2 Testing PAdES-E-BES signatures

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

Table 2: Test cases for PAdES-E-BES signatures

TC ID	Description	Pass criteria	Signature attributes
PAdES/BES/1	This test case tests the simplest PAdES-E-BES signature without signature-time-stamp and with M entry in signature dictionary. ContentType, ESSSigningCertificateV2 and MessageDigest attributes shall be added to the PDF signature as specified in CAdES [4].	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 o SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2
PAdES/BES/2	This test case tests a PAdES-E-BES signature without signature-time-stamp and with M, Location, Reason and ContactInfo entries in signature dictionary. ContentType, ESSSigningCertificateV2 and MessageDigest attributes shall be added to the PDF signature as specified in CAdES [4].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M, Location, Reason, ContactInfo 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 Reason o ContactInfo o ByteRange o Contents (DER CMS)) o Certificates o SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2
PAdES/BES/3	This test case tests the simplest PAdES-E-BES signature with signature-time-stamp attribute. ContentType, ESSSigningCertificateV2, MessageDigest and SignatureTimeStamp attributes shall be added to the PDF signature as specified in CAdES [4].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, 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 ByteRange o Contents (DER CMS) o Certificates SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 o SignatureTimeStamp

TC ID	Description	Pass criteria	Signature attributes
PAdES/BES/4	This test case tests a PAdES-E-BES signature with signature-time-stamp and an instance of ClaimedAttributes of SignerAttributesV2 attribute. ContentType, ESSSigningCertificateV2, MessageDigest and SignatureTimeStamp attributes shall also be added to the PDF signature as specified in CAdES [4].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, 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, SignerAttributesV2, 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 ByteRange o Contents (DER CMS) o Certificates SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 o SignerAttributesV2 ▪ ClaimedAttr o SignatureTimeStamp
PAdES/BES/5	This test case tests a PAdES-E-BES signature with a ContentTimeStamp attribute which provides time-stamp token of the signed data content before it is signed. ContentType, ESSSigningCertificateV2, MessageDigest and SignatureTimeStamp attributes shall also be added to the PDF signature as specified in CAdES [4].	Positive validation. The signature dictionary shall contain Type, Contents, Filter, 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, ContentTimeStamp signed attributes and SignatureTimeStamp unsigned attribute.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o ETSI.CAdES.detached o ByteRange o Contents (DER CMS) o Certificates SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 o ContentTimeStamp o SignatureTimeStamp

5.3 Testing PAdES-E-EPES signatures

Table 3 shows which attributes are required to generate PAdES-E-EPES signatures for each test case.

Table 3: Test cases for PAdES-E-EPES signatures

TC ID	Description	Pass criteria	Signature attributes
PAdES/EPES/1	This test case tests a PAdES-E-EPES signature with Reason, Location, ContactInfo entries in signature dictionary and MessageDigest, ContentType, SignaturePolicyIdentifier, SignatureTimeStamp and ESSSigningCertificateV2 attributes in the CADES [4] signature.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, Reason, Location, ContactInfo 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, SignaturePolicyIdentifier, MessageDigest signed attributes and SignatureTimeStamp unsigned attribute.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o ETSI.CAdES.detached o Reason o Location o ContactInfo o ByteRange o Contents (DER CMS) o Certificates SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 o SignaturePolicyIdentifier o SignatureTimeStamp
PAdES/EPES/2	This test case tests a PAdES-E-EPES signature with MessageDigest, ContentType, SignaturePolicyIdentifier, SignatureTimeStamp, CommitmentTypeIndication and ESSSigningCertificateV2 attributes in the CAdES [4] signature.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, 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, SignaturePolicyIdentifier, MessageDigest, CommitmentTypeIndication signed attributes and SignatureTimeStamp unsigned attribute	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o ETSI.CAdES.detached o ByteRange o Contents (DER CMS) o Certificates SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 o SignaturePolicyIdentifier o CommitmentTypeIndication o SignatureTimeStamp

6 Testing interoperability of PAdES-E-LTV signatures

6.1 Testing PAdES-E-LTV signatures

This clause refers to clause 5.5 of ETSI EN 319 142-2 [3]. The test cases in this clause have been defined for different combinations of PAdES-E-LTV signatures attributes. They test the use of PDF signatures, as described in clause 5.5 of ETSI EN 319 142-2 [3].

Mandatory attributes for PAdES-E-LTV signatures described in ETSI EN 319 142-2 [3], clause 5.5, shall be present.

The PAdES specification [3] supports Long Term Validation (LTV) of PDF Signatures using some extensions from ISO 32000-1 [1]. They are:

- Document Security Store (DSS) that is able to carry validation data necessary to validate a signature, optionally with:
  - Validation Related Information (VRI) which relates the validation data to a specific signature.
- Document time-stamp that is able to extend document life-time.

PAdES-E-LTV signatures are generated by augmenting CMS digital signatures in PDF and/or PAdES-E-BES, PAdES-E-EPES signatures. Table 4 shows which attributes are required to generate PAdES-E-LTV signatures for each test case.

Table 4: Test cases for PAdES-E-LTV signatures

TC ID	Description	Pass criteria	Signature attributes
PAdES/LTV/1	This test case previews the generation and verification of the CMS digital signature in PDF of the test case PAdES/CMS/1 and subsequent augmentation to a PAdES-LTV format based on DSS with Certs and CRLs. Then one Document Time Stamp shall be applied and verified.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType and SignerInfo attributes. The DSS dictionary shall contain the Type, Certs and CRLs entries. The DTS dictionary shall contain the Type, SubFilter and Contents entries.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o M o ByteRange o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo • DSS o Type o Certs o CRLs • DTS o Type o SubFilter o Contents
PAdES/LTV/2	This test case previews the generation and verification of the CMS digital signature in PDF of the test case PAdES/CMS/2 and subsequent augmentation to a PAdES-LTV format based on DSS with Certs and OCSPs. Then one Document Time Stamp shall be applied and verified.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, Reason, Location, ContactInfo and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType and SignerInfo attributes. The DSS dictionary shall contain the Type, Certs and OCSPs entries. The DTS dictionary shall contain the Type, SubFilter and Contents entries.	• SignatureDictionary o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o Reason o Location o ContactInfo o ByteRange o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo o SignatureTimeStamp • DSS o Type o Certs o OCSPs • DTS o Type o SubFilter o Contents

TC ID	Description	Pass criteria	Signature attributes
PAdES/LTV/3	This test case previews the generation and verification of the PAdES-E-BES signature of the test case PAdES/BES/1 and subsequent augmentation to a PAdES-LTV format based on DSS with Certs and CRLs. Then one Document Time Stamp shall be applied and verified.	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. The DSS dictionary shall contain the Type, Certs and CRLs entries. The DTS dictionary shall contain the Type, SubFilter and Contents entries.	• 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 o SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 • DSS o Type o Certs o CRLs • DTS o Type o SubFilter o Contents
PAdES/LTV/4	This test case previews the generation and verification of the PAdES-E-BES signature of the test case PAdES/BES/1 and subsequent augmentation to a PAdES-LTV format based on DSS with Certs, CRLs and VRI entries and VRI dictionary with Cert and CRL entries. Then a Document time-stamp shall be applied and verified.	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. The DSS dictionary shall contain the Type, Certs, CRLs and VRI entries. The VRI dictionary shall contain the Type, Cert and CRL entries. The DTS dictionary shall contain the Type, SubFilter and Contents entries.	• 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 o SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 • DSS o Type o Certs o CRLs o VRI • VRI o Type o Cert o CRL • DTS o Type o SubFilter o Contents

TC ID	Description	Pass criteria	Signature attributes
PAdES/LTV/5	This test case previews the generation and verification of the CMS digital signature in PDF of the test case PAdES/CMS/6, including 2 serial signatures, and subsequent augmentation to a PAdES-LTV format based on DSS with Certs, OCSPs and VRI entries and VRI dictionary with Cert and OCSP entries. Then a Document time-stamp shall be applied and verified.	Positive validation. The signature dictionary shall contain Type, Contents, Filter, SubFilter, M and ByteRange entries. The DER-encoded PKCS #7 binary data object included in the Contents entry shall include the SigningCertificate (in SignedData.certificates field), ContentType and SignerInfo attributes. The DSS dictionary shall contain the Type, Certs, OCSPs and VRI entries. The VRI dictionary shall contain the Type, Cert and OCSP entries. The DTS dictionary shall contain the Type, SubFilter and Contents entries.	• SignatureDictionary (2 entries) o Type o Sig o Filter o Adobe.PPKLite o SubFilter o adbe.pkcs7.detached o M o ByteRange o Contents (DER PKCS #7) o Certificates o SigningCertificate o ContentType o SignerInfo • DSS o Type o Certs o OCSPs o VRI • VRI o Type o Cert o OCSP • DTS o Type o SubFilter o Contents
PAdES/LTV/6	This test case previews the generation and verification of a PAdES-E-BES signature including 2 PAdES/BES/1 signatures, and subsequent augmentation to a PAdES-LTV format based on DSS with Certs, OCSPs and VRI entries and VRI dictionary with Cert and OCSP entries. Then a Document time-stamp shall be applied and verified.	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. The DSS dictionary shall contain the Type, Certs, OCSPs and VRI entries. The VRI dictionary shall contain the Type, Cert and OCSP entries. The DTS dictionary shall contain the Type, SubFilter and Contents entries.	• SignatureDictionary (2 entries) 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 o SigningCertificate o ContentType o MessageDigest o ESSSigningCertificateV2 • DSS o Type o Certs o OCSPs o VRI • VRI o Type o Cert o OCSP • DTS o Type o SubFilter o Contents

7 Testing interoperability of XAdES signatures signing XML content in PDF

7.1 Introduction

This clause refers to clause 6 of ETSI EN 319 142-2 [3]. The test cases in this clause have been defined for different combinations of XAdES signatures signing XML content in PDF attributes. They test the use of XML signatures within the PDF container.

7.2 Testing XAdES signatures of XML documents embedded in PDF containers

An XML document created and signed with XAdES signatures according to ETSI EN 319 132-1 [2] out of PDF framework can be embedded within a PDF container and transported within it.

For the purpose to verify the signatures of an XML document signed with XAdES [2] and embedded within a PDF container long after their creation, a verifier may extract the XML document, verify the XAdES signature, augment the XAdES signature itself (to more evolved forms) and embed again the modified XAdES signature within the PDF container.

Minimum requirement: The xades:SigningCertificateV2 or the ds:KeyInfo element shall be used to secure the signing certificate.

Table 5 shows which attributes are required to generate XAdES signatures of XML documents embedded in PDF containers for each test case.

Table 5: Test cases for XAdES signatures of XML documents embedded in PDF containers

TC ID	Description	Pass criteria	Signature attributes
PAdES/XML/1	This test case tests a XAdES-B-B signature with the signed properties "SignedSignatureProperties", conforming to ETSI EN 319 132-1 [2], containing the SigningTime, SigningCertificateV2, SignatureProductionPlaceV2, SignerRoleV2 properties.	Positive validation. The XAdES signature shall contain the SignedInfo, SignatureValue, SigningTime, SigningCertificateV2, SignatureProductionPlaceV2, SignerRoleV2 properties.	• SignedInfo • SignatureValue • SignedSignatureProperties o SigningTime o SigningCertificateV2 o SignatureProductionPlaceV2 o SignerRoleV2
PAdES/XML/2	This test case tests a XAdES-B-T signature with the signed properties "SignedDataObjectProperties" and unsigned properties SignatureTimeStamp conforming to ETSI EN 319 132-1 [2]. The CommitmentTypeIndication, AllDataObjectsTimeStamp, "SignedDataObjectProperties" shall be used.	Positive validation. The XAdES signature shall contain the SignedInfo, SignatureValue, SigningCertificateV2, CommitmentTypeIndication, AllDataObjectsTimeStamp and SignatureTimeStamp attributes.	• SignedInfo • SignatureValue • SignedSignatureProperties o SigningCertificateV2 • SignedDataObjectProperties o CommitmentTypeIndication o AllDataObjectsTimeStamp • UnsignedSignatureProperties o SignatureTimeStamp
PAdES/XML/3	This test case tests a XAdES-B-B signature with a countersignature attribute.	Positive validation. The XAdES signature shall contain the SignedInfo, SignatureValue, SigningCertificateV2 and CounterSignature attributes.	• SignedInfo • SignatureValue • SignedSignatureProperties o SigningCertificateV2 • UnsignedSignatureProperties o CounterSignature

7.3 Testing XAdES signatures on XFA forms

The XAdES signature will be able to sign XFA data only or any XML content from XFA allowed by XFA specification. Signature is encoded as XAdES-B-B and XAdES-B-T forms.

The xades:SigningCertificateV2 or the ds:KeyInfo element shall be used to secure the signing certificate.

For long-term validation XAdES signatures on XFA use the XADES-B-LTA forms.

Table 6 shows which attributes are required to generate XAdES signatures on XFA forms for each test case.

Table 6: Test cases for XAdES signatures on XFA forms

TC ID	Description	Pass criteria	Signature attributes
PAdES/XFA/1	This test case tests a XAdES signature on XFA forms in which the XFA signed file is a XADES-B-T signature conforming ETSI EN 319 132-1 [2] with the signed properties SigningCertificateV2, SignatureProductionPlaceV2, SignerRoleV2 and the SignatureTimeStamp unsigned property.	Positive validation. The XAdES signature shall contain the SignedInfo, SignatureValue, SigningCertificateV2, SignatureProductionPlaceV2, SignerRoleV2 and SignatureTimeStamp properties.	• SignedInfo • SignatureValue • SignedSignatureProperties o SigningCertificateV2 o SignatureProductionPlace V2 o SignerRole • UnsignedSignatureProperties o SignatureTimeStamp
PAdES/XFA/2	This test case tests a XAdES-B-B signature with a countersignature attribute. The XFA signed file is XAdES-B-B conforming ETSI EN 319 132-1 [2] with a CounterSignature	Positive validation. The XAdES signature shall contain the SignedInfo, SignatureValue, SigningCertificateV2 and CounterSignature attributes.	• SignedInfo • SignatureValue • SignedSignatureProperties o SigningCertificateV2 • UnsignedSignatureProperties o CounterSignature

8 Testing negative additional PAdES signatures

8.1 CMS digital signatures in PDF test cases

The test cases in this clause have been defined for CMS digital signatures in PDF.

Table 7 summarizes negative test cases for CMS digital signatures in PDF.

Table 7: Negative test cases for CMS digital signatures in PDF

TC ID	Description
PAdES/CMSN/1	Verify a signed pdf document having a wrong byte range
PAdES/CMSN/2	Verify a signed pdf document having a wrong signature (the hash that was signed is not the hash of the specified byte range)
PAdES/CMSN/3	Verify a pdf document signed with an untrusted signing certificate
PAdES/CMSN/4	Verify a pdf document signed with an expired signing certificate
PAdES/CMSN/5	Verify a pdf document signed with a revoked/suspended signing certificate
PAdES/CMSN/6	Verify a signed pdf document containing an untrusted signature timestamp
PAdES/CMSN/7	Verify a signed pdf document containing an expired signature timestamp
PAdES/CMSN/8	Verify a signed pdf document containing a revoked signature timestamp

8.2 PAdES-E-BES and PAdES-E-EPES test cases

The test cases in this clause have been defined for PAdES-E-BES and PAdES-E-EPES signatures.

Table 8 summarizes negative test cases for PAdES-E-BES and PAdES-E-EPES signatures.

Table 8: Negative test cases for PAdES-E-BES and PAdES-E-EPES signatures

TC ID	Description
PAdES/BESN/1	Verify a signed pdf document having a wrong byte range
PAdES/BESN/2	Verify a signed pdf document having a wrong signature (the hash that was signed is not the hash of the specified byte range)
PAdES/BESN/3	Verify a signed pdf document having a wrong time stamp signature (the signature that was timestamped is not pdf document signature)
PAdES/BESN/4	Verify a pdf document signed with an untrusted signing certificate
PAdES/BESN/5	Verify a pdf document signed with an expired signing certificate
PAdES/BESN/6	Verify a pdf document signed with a revoked/suspended signing certificate
PAdES/BESN/7	Verify a signed pdf document containing an untrusted signature timestamp
PAdES/BESN/8	Verify a signed pdf document containing an expired signature timestamp
PAdES/BESN/9	Verify a signed pdf document containing a revoked signature timestamp
PAdES/BESN/10	Verify a signed pdf document in which the hash value of the signing certificate is different from the hash value in signing certificate or ESS signing certificate V2 attribute
PAdES/BESN/11	Verify a signed pdf document containing commitment-type-indication attribute and the attribute reason of the dictionary (ETSI EN 319 142-2 [3], clause 5.3)

8.3 PAdES-E-LTV test cases

The test cases in this clause have been defined for PAdES-E-LTV signatures.

Table 9 summarizes negative test cases for PAdES-E-LTV signatures.

Table 9: Negative test cases for PAdES-E-LTV signatures

TC ID	Description
PAdES/LTVN/1	Verify a PAdES-E-LTV signature in which the Document Time Stamp has a wrong signature (the hash that was signed isn't the hash computed on the specified byte range
PAdES/LTVN/2	Verify a PAdES-E-LTV signature which one timestamp is invalid at the time of the successive (in time) timestamp (TSS certificate expired or revoked)
PAdES/LTVN/3	Verify a PAdES-E-LTV signature in which the signature is not valid in respect of validation data stored in the DSS

History

Document history		
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