



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Mr. Michel Ayral
Director
European Commission
DG ENTR and Industry C
BREY 45, 8/120
B- 1049 BRUSSELS

Ref. CORR/M127/ADC

Subject: Revised answer to mandate M/127

2006-06-12

Dear Mr. Ayral,

Please find herewith, for your acceptance, the revised answer of CEN/TC 193 "Adhesives" to the mandate M/127 "Construction adhesives".

You will also find in annex the comments of Mr. Joël Cuche, the CEN Consultant responsible for the mandated work under M/127.

Yours sincerely

Stephen Russell
Director, Standards

c.c. Mr. N. Anselmann, Mr. R. Klein
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Wezembeek, the 24th October 2005

CEN Management Centre
Att. Mr Da Costa
Rue de Stassart 35
1050 Brussels


Subject : Mandate M 127. Revised answer to the Mandate

Dear Amilcar

I have examined carefully the revised answer to the Mandate M127 drafted by TC193 under their document CEN/TC193 N805 and I consider the document can be accepted and forwarded to the Commission for final approval and in particular for the acceptance of the deletion of WI 193127 as a mandated product.

Do you need more clarifications, please do not hesitate contacting me

Sincerely yours



J.CUCHE



CEN/TC 193
"Adhesives"

N 805
(2005-03-17)

☐ For information only

For voting

☐ By correspondence (Deadline: 2004-11-19)

☐ At meeting (yyyy-mm-dd)

☐ For comments (Deadline: yyyy-mm-dd)

**PROPOSAL TO AMEND
CEN/TC 193 REPLY TO
MANDATE M/127**

- This document has been revised according to Mr DACOSTA proposals. Only the updated target dates for WI 193174 have been included in N 575 REV

Document identification: Answer to mandate M/127 submitted by CEN's letter dated 1999-05-05

Technical Committee TC 193

Date 2004-10-19

Documents	Reference Number	Date of issue
Mandate number	M 127	1999-01-26
Original answer to the Mandate	CEN/TC 193 N 575 REV	2000-06-22
Commission's acceptance	Nr 10210-ref ENTR/G5/AM/si860324	2000-08-03

List of changes :

Clause of the original document	Reason for the change (short description)	Supporting information (if relevant)
<p>A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS</p> <p><u>A.1 Harmonised product standard</u></p> <p><u>A.1.1 All adhesives other than anaerobic adhesives</u></p> <p><u>A.1.1.1 Adhesives primarily intended for the bonding of wood to wood</u></p> <p><u>a) Phenolic/resorcinolic and aminoplastic adhesives</u></p> <p>WI 193127 Adhesives, phenolic and aminoplastic, for load bearing timber structures. Classification and performance requirements (EN 301: 1992Rev)</p>	<p>CEN/TC 193 intends to eliminate this WI from the answer to M/127 without substitution. This WI is intended to address adhesives used exclusively off-site, i.e. for a purpose stated by Footnote 2 of M/127 to be outside the Mandate. The reason not to harmonise this type of adhesive is that it is not possible to comply with the Mandate characteristics on the product alone. The Mandate characteristics can be verified only on the finished product. Phenolic and aminoplastic adhesives are unsuitable for use on site.</p>	
<p>A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS</p> <p><u>A.1 Harmonised product standard</u></p> <p><u>A.1.1 All adhesives other than anaerobic adhesives</u></p> <p><u>A.1.1.1 Adhesives primarily intended for the bonding of wood to wood</u></p> <p><u>b) Adhesives other than phenolic/resorcinolic and aminoplastic adhesives</u></p>	<p>This WI is at present 193167. CEN/TC 193 intends to eliminate WI 193167 from the answer to M/127. The Mandate characteristics can be verified only on the finished product. Some of these type of adhesives (other than phenolic and aminoplastic) could be used on site but some could not. WI 193167 is intended to address those adhesives used exclusively off-site, i.e. for a purpose stated by Footnote 2 of M/127 to be outside the Mandate. It is the intention of this TC to develop an</p>	

WI 193XXX (NEW) Adhesives other than phenolic and aminoplastic for load bearing timber structures. Test methods, classification and performance requirements	appropriate standard for adhesives to be used on site. This project is expected to take five years because of the tests to be developed. In two years time this TC should be in the position to decide on the creation of the NWI based on the progress made on the tests.	
A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS A.1 Harmonised product standard <u>A.1.1 All adhesives other than anaerobic adhesives</u> A.1.1.2 General purpose adhesives WI 193XXX General purpose adhesives for structural assembly – Requirements and test methods	This is at present WI 193174. Tensile strength, fatigue strength impact resistance and creep will have to be given only for adhesives used in very specific applications. New target dates are proposed: Stage 32: 2004-12 Stage 40: 2005-06 Stage 49: 2006-10	These characteristics are only relevant in specific applications but not generally, therefore they are not commonly measured. The behaviour of the adhesive depends directly on the application itself.
A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS A.2. Supporting standards a) Adhesives other than anaerobic adhesives primarily intended for the bonding of wood to wood • <u>Bond strength expressed as fatigue</u> WI 193XXX (NWI) Structural adhesives. Test methods. Part 6: Determination of the effective elastic limit and secant modulus of ductile structural adhesives.	This is at present WI 193176. CEN/TC 193 intends to substitute WI 193176 by EN ISO 9664:1995 to determine fatigue properties.	See document TC 193 N 790 (attached) for the detailed explanation.
A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS A.2. Supporting standards b) General purpose, non-anaerobic adhesives • <u>Bond strength as shear</u> prEN 2243-1 Aerospace series. Non metallic materials. Structural adhesives. Test method. Part 1: Single lap	CEN/TC 193 intends to substitute prEN 2243-1 by EN 1465, <i>Adhesives – Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies (ISO 4587:1979 modified)</i> . prEN 2243-1 is an AECMA project which is not public available, and CEN does not allow to make reference to not available documents. EN 1465 may be used for the same determination.	

shear Under preparation by AECMA, WI 04000267		
A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS A.2. Supporting standards b) General purpose, non-anaerobic adhesives <ul style="list-style-type: none">• <u>Bond strength expressed as fatigue</u> WI 193XXX (NWI) Structural adhesives. Test methods. Part 6: Determination of the effective elastic limit and secant modulus of ductile structural adhesives.	This is at present WI 193176. CEN/TC 193 intends to substitute WI 193176 by EN ISO 9664:1995 to determine fatigue properties.	See document TC 193 N 790 (attached) for the detailed explanation.
A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS A.2. Supporting standards c) Anaerobic adhesives used specifically to bond co-axial metallic assemblies comprising fasteners-threaded and otherwise, pipes and tubes <ul style="list-style-type: none">• <u>Bond Strength expressed as shear strength</u> prEN 3793 "Aerospace series. Anaerobic polymerisable compounds. Test method. Determination of static shear strength" Under development in AECMA.	CEN/TC 193 intends to substitute prEN 3793 by the adoption of ISO 10123 modified as this is a more practical standard for the determination of bond strength expressed as shear strength. ISO 10123 is widely used in general industrial application areas and most of the technical data for anaerobic adhesives are measured in accordance to that ISO standard. The modifications will refer mainly to the dimensions of the test specimens.	
A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS A.2. Supporting standards <u>Creep</u> b) General purpose, non-anaerobic, adhesives WI 193XXX (NWI) Structural adhesives. Test methods. Determination of the effective elastic limit and secant shear modulus of ductile structural adhesives. Stage 40: 2003-12	This is at present WI 193176. CEN/TC 193 intends to substitute WI 193176 by the adoption of ISO 15109:1998 (modified or not) as EN Standard to determine creep properties.	See document TC 193 N 790 (attached) for the detailed explanation.



CEN/TC 193 N 575REV

(2005-03-17)

MANDATE ON "CONSTRUCTION ADHESIVES" (M 127) REPLY FROM CEN/TC 193 "Adhesives"

0) General comments from TC 193 related to the answer to the mandate

0.1) *Requests for clarification on the scope of the mandate concerning the products and allocation of work:*

Although this is not exactly a request for clarification on the scope of the mandate, TC 193 wishes to call attention to the fact that Mandate 127, as produced by the European Commission DG III, contains footnotes that are not in the text of the Mandate distributed by CEN/MC to CEN/BT members in "pdf format" for voting on 1999-06-16. The footnotes are very relevant as they specify the products excluded from the mandate.

TC 193 endorses the contents of the above mentioned footnotes and agrees to them.

0.2) *Requests for clarification on the intended uses:*

None

0.3) *Information on products under the scope of the mandate which are the subject of other CEN/TCs- Information on the organisation of the work between TCs:*

CEN/TC 67 "Ceramic tiles" will provide the answer to the mandate in respect of ceramic tile adhesives.

0.4) *Information on issues concerning the scope and intended uses included in the mandate, for which no work has yet been started in the TC, or for which the TC cannot provide a standard*

- Silicones. CEN/TC 193 has never worked on silicone adhesives. However, it is a subject of interest (silicones behave structurally in buildings) and a new WG could be constituted for it. CEN/TC 193 will investigate this possibility and will provide an answer as soon as possible. To do this, EOTA guides ETAG D02 Parts 1 and 2 (drafts) will be used as reference documents.
- Wood, when bonded to itself to form a timber based, laminated beam [of the type known as a 'Glu-lam' beam] intended for use as a major structural, load bearing element. This exemption, is only intended to be temporary. It is to be reviewed in 2003 in the light of intended investigations and the consequent development of new standards [CEN/TC 193/SC 1].
- Concrete bonded either to itself or steel or a material based on carbon fibre
- Adhesives used for the repair of concrete

0.5) *Specific requests for additions to the mandate of products, materials, intended uses, essential characteristics, etc.:*

None

0.6) *Liaison with other TCs for certain horizontal test – Information on the organisations of the work between the TCs:*

Mandate M 127 is also addressed to CEN/TC 67 “Ceramic tiles” however no specific liaison is considered necessary, as there are no crossed points foreseen in the preparation of the standards.

CEN/TC 264 Air quality
European Association of Aerospace Manufacturers (AECMA)

0.7) *Other issues which the TC considers necessary for the comprehension of the answer to the mandate:*

0.7.1 *Reaction to fire*

Adhesives are only exposed directly to fire when they are used as “coatings” in which case they are not “structural adhesives” and therefore are not covered by this mandate.

In structural uses, the contribution adhesives make when bonded components burn is usually considered to be an integral part of the acceptable, or otherwise, performance of the building assembly.

For this reason, the direct measurement of an adhesive’s reaction to fire has not, historically, been taken into consideration.

Specified building zones and designated escape routes should be built with materials of Class A. Adhesives used in conjunction with materials of Class A are not subject to the action of fire.

0.7.2 *Dangerous substances*

The group of ENVs proposed to detect dangerous substances are useful to measure the emission of volatile organic compounds, volatile aldehydes and volatile diisocyanates from low solvent and solvent free adhesives after application. They do not cover the emission of substances in the event of fire.

0.7.3 *Tensile strength*

Tensile strength can be measured. However, it is not generally used in practice. It is known that very few companies measure it to determine structural performance. For the purpose of simplification and horizontality, adhesive strength, as determined by a tensile test, may be more conveniently assessed by a tensile shear test

0.7.4 *Fatigue strength*

There are tests to measure it. However, the results are not suitable for comparative purposes as adhesives with differing moduli behave in a different manner. Neither are the results applicable for conditions differing from those of the test because the fatigue observed is a function of the geometry of the test pieces. Thus, for example in the case of low modulus adhesives the larger the bonded area, the better the fatigue strength which can result.

Thus, for the purposes of simplification, horizontality and general utility of design, fatigue resistance can be conveniently and best assessed in terms of an adhesive’s elastic limit.

0.7.5 *Impact resistance*

This test is not useful in the adhesives field. The performance observed is excessively influenced by the function of the test equipment. There are no known reliable results published in the technical bibliography.

For the purpose of simplification and horizontality impact resistance can be conveniently assessed in terms of an adhesive's resistance to distortion as measured by means of a "T" peel test.

0.7.6 *Fatigue and creep*

The fatigue and creep properties of structural adhesives may be determined by measuring their elastic limit and shear modulus. prEN 2243-6 provides a means of measuring these latter characteristics for stiff adhesives: however, it is unsuitable for the more ductile structural adhesives, which are used in association with large, bonded areas. For this reason a new work item is proposed that will be based on prEN 2243-6. The new standard would develop prEN 2243-6 in such a manner that the secant shear modulus and hysteresis characteristics of ductile adhesives can be measured; from which, their effective elastic limit can also be determined.

Consideration should also be given to limiting fatigue and creep requirement to special situations and determining just what those circumstances should be.

A. ADHESIVES FOR BONDING STRUCTURAL COMPONENTS

A.1 Harmonised product standard

A.1.1 All adhesives other than anaerobic adhesives

A.1.1.1 Adhesives primarily intended for the bonding of wood to wood

- a) Phenolic/resorcinolic and aminoplastic adhesives
(This WI is eliminated without substitution)

WI 193127

Dates of availability
Stage 32: (realized) 1999-07
Stage 40: 2001-01
Stage 49: 2002-07

~~(i) Title: Adhesives, phenolic and aminoplastic, for load bearing timber structures. Classification and performance requirements (EN 301: 1992Rev)~~

~~(ii) Scope This European Standard establishes a classification for phenolic and aminoplastic polycondensation adhesives according to their suitability for use for load bearing timber structures in defined climatic exposure conditions, and specifies performance requirements for such adhesives for the manufacture of load bearing timber structures only.~~

~~The performance requirements of this standard apply to the adhesive only, not to the structure. This standard does not primarily cover the performance of adhesives for the production of wood based panels.~~

~~(iii) Intended use This standard is primarily intended for the use of adhesive manufacturers and for the use in timber structures bonded with adhesives, to assess or control the quality of adhesives. This standard only specifies the performance of an adhesive for use in an environment corresponding to the defined conditions.~~

~~Such an adhesive meeting the requirements of this standard for its type is adequate for use in a load bearing structure, provided that the bonding process has been carried out according to an appropriate product standard~~

~~(iv) The essential characteristics according to the mandates which will be dealt with in the above standard will be:~~

1.1 Bond Strength

~~This characteristic is assessed by means of a tensile shear strength test.~~

1.2 Tensile strength (see 1.1. above)

~~1.3 Fatigue strength: Fatigue strength is not relevant for phenolic/resorcinolic and aminoplastic adhesives.~~

~~1.4 Impact resistance: There is no reproducible test available.~~

~~1.5 Heat resistance: This characteristic has no significance for phenolic/resorcinolic and aminoplastic adhesives.~~

~~1.6 Creep: This characteristic has no significance for phenolic/resorcinolic and aminoplastic adhesives.~~

~~2 Reaction to fire: Not relevant (See 0.7.1)~~

~~3 Release of dangerous substances (See 0.7.2)~~

~~(v) — Durability~~

~~— Delamination test
— Fibre damage test
— Shrinkage test~~

~~(vi) — Other aspects:~~

~~The harmonised product standard will also contain:~~

~~— a reference to the Commission's Decision of attestation of conformity
— clauses on the evaluation of conformity including factory production control
— guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics~~

~~b) — Adhesives other than phenolic/resorcinolic and aminoplastic adhesives~~

~~(In two years time, CEN/TC 193 should be in the position to decide on the creation of a NWI in substitution of this)~~

~~WI 193XXX (NEW)~~

Dates of availability

Stage 32: 2004-06

Stage 40: 2005-12

Stage 49: 2006-09

~~(i) — Title: Adhesives other than phenolic and aminoplastic for load-bearing timber structures. Test methods, classification and performance requirements~~

~~(ii) Scope This European Standard establishes a classification for adhesives other than phenolic and aminoplastic polycondensation adhesives according to their suitability for use for load-bearing timber structures in defined climatic exposure conditions, and specifies performance requirements for such adhesives for the manufacture of load-bearing timber structures only.~~

~~The performance requirements of this standard apply to the adhesive only, not to the structure. This standard does not primarily cover the performance of adhesives for the production of wood-based panels.~~

~~(iii) Intended use This standard is primarily intended for the use of adhesive manufacturers and for the use in timber structures bonded with adhesives, to assess or control the quality of adhesives. This standard only specifies the performance of an adhesive for use in an environment corresponding to the defined conditions.~~

~~Such an adhesive meeting the requirements of this standard for its type is adequate for use in a load-bearing structure, provided that the bonding process has been carried out according to an appropriate product standard~~

(iv) ~~The essential characteristics according to the mandates which will be dealt with in the above standard will be:~~

1.1 Bond Strength

~~This characteristic is assessed by means of a tensile shear strength test.~~

1.2 Tensile strength (see 1.1. above)

1.3 Fatigue strength: ~~Fatigue strength for this group of adhesives can be conveniently assessed in terms of the adhesives elastic limit.~~

1.4 Impact resistance: ~~There is not reproducible test available.~~

1.5 Heat resistance: ~~measured in [MPa].~~

1.6 Creep

2 Reaction to fire: ~~Not relevant (See 0.7.1)~~

3 Release of dangerous substances: ~~(See 0.7.2)~~

(v) ~~Durability~~

- ~~— Delamination test~~
- ~~— Fibre damage test~~
- ~~— Shrinkage test~~

(vi) ~~Other aspects:~~

~~The harmonised product standard will also contain:~~

- ~~— a reference to the Commission's Decision of attestation of conformity~~
- ~~— clauses on the evaluation of conformity including factory production control~~
- ~~— guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics~~

A.1.1.2 General purpose adhesives

WI 193XXX (NEW) - This is at present WI 193174

Dates of availability
Stage 32: 2004-12
Stage 40: 2005-06
Stage 49: 2006-10

(i) **Title:** General purpose adhesives for structural assembly – Requirements and test methods

(ii) **Scope:** This European Standard specifies requirements for adhesives intended for use in the creation and general assembly of load-bearing, structural elements used in civil engineering works and the construction of buildings. Other than the exceptions stated, it embraces all combinations of bonded materials, used to create or repair load-bearing elements.

It covers individual adhesives and special purpose kits comprising various combinations of adhesive types and components.

It includes test methods and methods of assessment.

Exceptions:

It does not cover:

- Prefabricated, bonded structural components
- Concrete bonded either to itself or steel or a material based on carbon fibre
- Wood, when bonded to itself to form a timber based, laminated beam [of the type known as a 'Glu-lam' beam] intended for use as a major structural, load bearing element.
- Thermoplastics [e.g. polythene, polypropylene, polyamide and fluorinated polymers in general] unless they have been specifically prepared [usually a specialised oxidative process] for bonded assembly on site.
- Co-axial metallic assemblies comprising fasteners- threaded and otherwise, pipes and tubes.
- Silicone adhesives used in structural glazing
- Those structural elements that are permanently immersed in water.

(iii) *Intended use:* Both internal and external construction elements and those cladding and covering elements (excluding ceramic tiles) specifically required, by regulatory authorities, to provide protection from fire in identified building zones, including escape routes.

(iv) *The essential characteristics according to the mandates which will be dealt with in the above standard will be:*

1.1 Bond Strength

Expressed as:

- Shear : measured in [MPa]
- Tensile: measured in [MPa]. Adhesive strength, as determined by a tensile test, may be more conveniently assessed by a tensile shear test.
- Peel: measured in [N/mm]
- Cleavage: measured in [N/mm]. This property can be conveniently assessed in terms of an adhesive's resistance to distortion as measured by means of a "T" peel test.

1.2 Tensile strength: measured in [MPa]. For this group of structural adhesives, this conventional measure has significance only in very specific applications.

1.3 Fatigue strength: measured in [MPa]. Fatigue resistance can be conveniently assessed in terms of an adhesive's "elastic limit". This characteristic has significance only in very specific applications.

1.4 Impact resistance: measured in [N/mm]. This property can be conveniently assessed in terms of an adhesive's resistance to distortion as measured by means of a "T" peel test. This characteristic has significance only in very specific applications.

1.5 Heat resistance: measured in [MPa].

1.6 Creep: measured in either [MPa] or [GPa] as appropriate. Creep resistance can be conveniently assessed in terms of an adhesive's "shear modulus". This characteristic has significance only in very specific applications.

2 Reaction to fire: Not relevant (See 0.7.1)

3 Release of dangerous substances: (See 0.7.2)

(v) *Durability:*

- Durability of tensile lap shear specimens in terms of general exposure to simulated weathering.

(vi) *Other aspects:*

The harmonised product standard will also contain:

- a reference to the Commission's Decision of attestation of conformity
- clauses on the evaluation of conformity including factory production control
- guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics

A.1.2 Anaerobic adhesives used to bond co-axial metallic assemblies comprising fasteners-threaded and otherwise, pipes and tubes

WI 193XXX This is at present WI 193175

Dates of availability
Stage 32: 2003-01
Stage 40: 2004-12
Stage 49: 2005-12

(i) *Title:* Structural adhesives. Characterisation of anaerobic adhesives for co-axial metallic assembly

(ii) *Scope:*

This standard covers anaerobic adhesives intended for the general assembly of co-axial metallic elements in building and civil engineering structures including fasteners- threaded and otherwise, pipes and tubes. It also presents test methods and methods of assessment. It embraces only metallic materials.

It covers individual adhesives and special purpose kits comprising various combinations of adhesives grades and components

(iii) *Intended use*

Both internal and external construction elements.

(iv) *The essential characteristics according to the mandate, which will be dealt with in the above standard, will be:*

1.1 Bond Strength

Expressed as:

- Shear:
 - Expressed as co-axial shear strength measured in [Mpa].
 - Expressed as torque strength measured in [Nm].

This group of structural adhesives is specifically formulated for the purpose of assembling co-axial, metallic elements – one within another. They have always been assessed in terms of their co-axial shear strength and resistance to torque when used to secure threaded fasteners.

- Tensile, Peel, Compression, Cleavage and Delamination. For this group of structural adhesives, these conventional measures have no significance.

1.2 Tensile strength

For this group of structural adhesives, these conventional measures have no significance.

1.3 Fatigue strength Expressed, for metallic pipe assemblies only, in terms of vibration resistance.

1.4 Impact resistance

For this group of structural adhesives, these conventional measures have no significance.

1.5 Heat resistance Expressed as co-axial shear strength in [MPa].

1.6 Creep

For this group of structural adhesives, these conventional measures have no significance.

2 Reaction to fire

Such small quantities are required to secure fittings and components that this is not a significant issue.

3 Release of dangerous substances:

These adhesives are used in such a minute amounts that no significant quantity of any substance is released during the adhesive's use. This issue is therefore seen as irrelevant.

(v) Durability aspects:

Durability of torque specimens in terms of general exposure to boiling water.

(vi) Other aspects:

The harmonised product standard will also contain:

- a reference to the Commission's Decision on attestation of conformity
- clauses on the evaluation of conformity [including factory Production Control]
- guidance on the characteristics to be stated in the labelling accompanying the CE marking and on the way of expressing the determined values of these characteristics

A.2 Supporting standards

The following ENs, prENs and WIs are proposed as test or calculation methods for the determination of the essential characteristics required by the mandate and indicated in clause A.1.1, A.1.2 above:

a) Adhesives other than anaerobic adhesives primarily intended for the bonding of wood to wood

- Bond strength expressed as shear strength

WI 193128

Adhesives for load-bearing timber structures. Test methods. Part 1: Determination of bond strength in longitudinal tensile shear. (EN 302-1:1992Rev.)
Stage 40: 2000-06

- Bond strength expressed as fatigue [excluding Phenolic/resorcinlic and aminoplastic adhesives]

prEN 2243-6

Aerospace series. Non metallic materials. Structural adhesives. Test method. Part 6: Determination of shear stress and shear strain.
Under preparation in AECMA. WI 04000272

~~WI 193XXX (NWI) This is at present WI 193176~~

~~Structural adhesives. Test methods. Part 6: Determination of the effective elastic limit and secant modulus of ductile structural adhesives.
Stage 32:~~

EN ISO 9664:1995 Adhesives. Test methods for fatigue properties of structural adhesives in tensile shear. (ISO 9664:1993)

b) General purpose, non-anaerobic adhesives

- Bond strength as shear

prEN 2243-1

~~Aerospace series. Non metallic materials. Structural adhesives. Test method. Part 1: Single lap shear
Under preparation by AECMA, WI 04000267~~

EN 1465: 1994 Adhesives. Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies. (ISO 4578:1990 modified)

- Bond strength as peel – used additionally as a measure of resistance to cleavage and impact forces..

EN 2243-2:1991

Aerospace series. Non metallic materials. Structural adhesives. Tests method. Part 2: Peel metal-metal

- Bond strength expressed as fatigue

prEN 2243-6

Aerospace series. Non metallic materials. Structural adhesives. Test method. Part 6: Determination of shear stress and shear strain.
Under preparation in AECMA. WI 04000272

~~WI 193XXX (NWI) This is at present WI 193176~~

~~Structural adhesives. Test methods. Part 6: Determination of the effective elastic limit and secant modulus of ductile structural adhesives.~~

Stage 32:

EN ISO 9664:1995 Adhesives. Test methods for fatigue properties of structural adhesives in tensile shear. (ISO 9664:1993)

- c) **Anaerobic adhesives used specifically to bond co-axial metallic assemblies comprising fasteners-threaded and otherwise, pipes and tubes**

- Bond strength expressed as shear strength

prEN 3793

~~"Aerospace series. Anaerobic polymerisable compounds. Test method. Determination of static shear strength"~~

~~Under development in AECMA.~~

NWI 193XXX adoption of ISO 10123: 1990 "Adhesives. Determination of shear strength of anaerobic adhesives using pin-and-collar specimens", modified.

- Bond strength expressed as torque strength

prEN 3794

Aerospace series. Anaerobic polymerisable compounds. Test method. Determination of torque strength on threaded fasteners.

Under development in AECMA.

- Bond strength expressed as fatigue

EN 751-1:1996

Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water. Part 1: Anaerobic jointing compounds.

(Note: this standard is only required for the assembly of threaded metal pipes and their connectors)

Heat resistance

- a) **Phenolic/resorcinolic and aminoplastic adhesives primarily intended for the bonding of wood to wood**

WI 193XXX (NEW) This is at present WI 193168

Adhesives for load-bearing timber structures. Adhesives other than phenolic and aminoplastic. Heat resistance.

Stage 32: 2004-06

- b) **General purpose, non-anaerobic, adhesives**

WI 193138

Adhesives. Mechanical behaviour of structural adhesively-bonded joints subjected to short term and long term exposure at specified conditions of temperature.

Stage 40: 2000-05

- d) **Anaerobic adhesives used specifically to bond co-axial metallic assemblies comprising fasteners-threaded and otherwise, pipes and tubes**

prEN 3792

Aerospace series. Anaerobic polymerisable compounds. Technical specification.

Under development in AECMA.

Creep

- a) **Adhesives, other than phenolic/resorcinolic and aminoplastic adhesives, primarily intended for the bonding of wood to wood**

WI 193XXX (NEW) This is at present WI 193169
Adhesives for load-bearing timber structures. Adhesives other than phenolic and aminoplastic. Creep.
Stage 32: 2004-06

- b) **General purpose, non-anaerobic, adhesives**

prEN 2243-6
Aerospace series. Non metallic materials. Structural adhesives. Test method. Part 6: Determination of shear stress and shear strain.
Under preparation in AECMA. WI 04000272

~~WI 193XXX (NWI) This is at present WI 193176~~
~~Structural adhesives. Test methods. Determination of the effective elastic limit and secant shear modulus of ductile structural adhesives.~~
~~Stage 40: 2003-12~~

NWI 193XXX. Adoption of ISO 15109:1998 Adhesives -- Determination of the time to rupture of bonded joints under static load

Release of dangerous substances

- a) **All groups of adhesives other than anaerobic adhesives**

WI 193150 (ENV)
"Adhesives. Short term method for measuring the emission properties of low-solvent or solvent free adhesives after application. Part 1: General procedure"
Stage 49: 2000-06

WI 193151 (ENV)
"Adhesives. Short term method for measuring the emission properties of low-solvent or solvent free adhesives after application. Part 2: Determination of volatile organic compounds"
Stage 49: 2000-12

WI 193152 (ENV)
"Adhesives. Short term method for measuring the emission properties of low-solvent or solvent free adhesives after application. Part 3: Determination of volatile aldehydes"
Stage 49: 2000-12

WI 193153 (ENV)
"Adhesives. Short term method for measuring the emission properties of low-solvent or solvent free adhesives after application. Part 4: Determination of volatile diisocyanates"
Stage 49: 2000-12

Durability

- a) **Adhesives, other than anaerobic adhesives, primarily intended for the bonding of wood to wood**

WI 193129
Adhesives for load-bearing timber structures. Test methods. Part 2: Determination of resistance to delamination (Laboratory method) (EN 302-2:1992 Rev.)
Stage 40: 2000-06

WI 193130

Adhesives for load-bearing timber structures. Test methods. Part 3: Determination of the effect of acid damage of wood fires by temperature and humidity cycling on the transverse tensile strength. (EN 302-3: 1992 Rev.)

Stage 40: 2000-06

WI 193131

Adhesives for load-bearing timber structures. Test methods. Part 4: Determination of the effects of wood shrinkage on the shear strength (EN 302-4:1992 Rev.)

Stage 32: 2000-06

b) General purpose, non-anaerobic, adhesives

EN 2243-5:1992

Aerospace series. Structural adhesives. Test methods. Part 5: Ageing tests.

c) Anaerobic adhesives used to bond co-axial metallic assemblies comprising fasteners-threaded and otherwise, pipes and tubes

prEN 3792

Aerospace series. Anaerobic polymerisable compounds. Technical specification.

Under development in AECMA.

A.3 Additional information, comments and remarks

3.1 Deviations from a performance approach in the product standard

None

3.2 Request for clarification on the scope of the mandate concerning the product in A.1.1 and A.1.2 above.

With respect to Annex 1 of the mandate, under “Products for consideration”, TC 193 wishes to clarify that:

- it is more correct to speak about “adhesives” than “resins”. Therefore, the list of examples should read: “(e.g. epoxy adhesives, polyurethane adhesives, acrylic adhesives, etc)”.
- instead of “structural adhesives” it is more correct to speak about “adhesives for bonding structural components”

The “products” listed below are the groups (chemical) of adhesives considered by CEN/TC 193 in the answer to the mandate. Products have been given the agreed international abbreviation for ease reference:

EP - epoxy adhesives
PRF - phenolic/resorcinolic adhesives
AC - toughened acrylic adhesives
PU - polyurethane adhesives
MF - aminoplastic adhesives
S - silicone adhesives
Other, including the specialised, anaerobic adhesives

This list does not intend to be exclusive in light of technological development.

3.3 Requests for clarification on the intended uses concerning the product under A.1.1 and A.1.2 above.

None

3.4 Request for clarification on the essential characteristics for the intended uses included in the mandate concerning the product under A.1.1 and A.1.2 above

CEN/TC 193 wishes to clarify that intended uses of adhesives are dealt with in terms of substrates to be bonded (metal, wood, etc.) and not in terms of the finished product (window, door, etc.).

Adhesives for bonding structural components are used in all combinations of the substrate materials as listed below:

- ceramic
- concrete (except for concrete bonded either to itself or steel or a material based on carbon fibre)
- glass
- metal
- plastic
- wood (with the temporary exception of the all-timber, laminated beams mentioned under General comments, 0.4)

For each type of union the product type that can be used is indicated using the international agreed abbreviation given in clause 3.2.

Substrate to Substrate [1]		Products used
Wood to wood	W-W	EP PRF AC PU MF
Wood to all other substrates	W-X	EP AC PU
All other material combinations	X-X	EP AC PU S[2]

[1] Note: Anaerobic adhesives are used specifically for the assembly of co-axial, metallic components and their use for any other purpose, within the context of this mandate, is deprecated.

[2] Note: Silicone adhesives will normally be used for structural purposes in conjunction with glass

3.5 Information on essential characteristics required by the mandate concerning the product in A.1.1 and A.1.2 above, for which no work has yet been started in the TC, or for which the TC cannot provide a standard

3.6 Explanation of the state of the art concerning durability issues

There are so many combinations of material, adhesive and exposure possible that it is effectively impossible to test for all circumstances. For this reason, TC 193 has referred, for the adhesives designated EP, AC and PU, to the standard used to evaluate the environmental durability of bonded aircraft joints prEN2243- 5. This standard is based on procedures that have a long established history of satisfactory performance and is the only standard available, for shear test specimens, that allows no variations in technique.

prEN 2243-5 is quite unsuitable for the evaluation of the water-based adhesives formulated essentially for the bonding of wood to wood. These, the PRF and MF types, are best assessed by their traditional techniques.

prEN 2243-5, which employs flat specimens, is also unsuitable for the evaluation of anaerobic adhesives. These are assessed by means of prEN 3792; a standard based on procedures that have a long established history of satisfactory performance and is the only standard available, for co-axial test specimens, that allows no variations in technique.

3.7 Information on other Directive under which the product in A.1.1 and A.1.2 above falls, and compliance conditions

None

3.8 Specific request for additions to the mandate of materials, intended uses or essential characteristics concerning the product in A.1 above

None.

3.9 Other issues which the TC considers necessary for comprehension of the answer to the mandate

None.