

A-Z Guideline

of the European Committee for Adhesive Bonding of Railway Vehicles (ECARV)



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Version No. 4, (2023-11-07)

Preamble

The A-Z Guideline is a compendium of the decisions of the ECARV. It complements the procedure for acquiring a certificate for carrying out adhesive bonding work on rail vehicles and parts of rail vehicles in accordance with EN 17460 and contains supplementary definitions, temporary regulations, restrictions and interpretations relating to the EN 17460.

When certification bodies, which are member of the ECARV, certifying companies according to EN 17460, it is mandatory for both (certification body and certifying company) to use the A-Z Guideline.

The A-Z Guideline is managed and kept up to date by the ECARV. Applications for inclusion of items must be sent in written form to the secretary of the ECARV (via the Certification Bodies or via ECARV@en17460.com).

Versions

Changes since the last version are underlined. The dates the decisions were made and all changes are shown via the version numbers. The version numbers correspond to the ECARV meetings.

Version	Meeting	Date
1	1 st Meeting	2022-06-15
2	2 nd Meeting	2022-11-03
3	3 rd Meeting	2023-05-12
4	<u>4th Meeting</u>	<u>2023-11-07</u>

Abbreviations

rABC	responsible Adhesive Bonding Coordinator (ABC in charge)
ABC	Adhesive Bonding Coordinator
ECARV	European Committee for Adhesive Bonding of Railway Vehicles
EWf	European Welding Federation

Corrections of the standard and notes

Correction in chapter 5.4.1

In EN 17460 chapter 5.4.1, sentence 1, reference is made to table 2. This is a mistake; what is meant is the reference to table 3.

(Revision 4)

Correction in chapter 5.3.4.4

In EN 17460 chapter 5.3.4.4, sentence 1, it is written „Adhesives shall be tested in accordance with Annex D“. It is meant “Adhesively bonded joints shall be tested in accordance with Annex D”.

(Revision 4)

1. Scope

1.1 Laminated safety glass

The production of laminated safety glass is not scope of EN 17460. This refers to the production of the laminate of glass with an internal film. Other bonded joints and seals involving laminated safety glass are subject to the standard.

(Revision: 3)

1.2 FRP (fibre reinforced plastic)

The EN 17460 does not apply when a bonded part is wrapped by the laminate and all the forces are taken up by the laminate itself. If the laminate cannot take up all the forces by itself EN 17460 will apply.

(Revision 3)

1.3 Screw retention

If the bolted joint is validated according to other standards the EN 17460 is not to be applied.

(Revision 4)

2. General

2.1 Version of EN 17460

In case of translation deviation, the English version of EN 17460 applies.

2.2 Transfer of a damaged rail vehicle

EN 17460 does not apply in the case of transporting damaged vehicles.

Country-specific requirements are given by the National Railway Safety Authorities of the countries. However, safety from personal injury must be ensured always.

(Revision 3)

2.3 Subcontracting

In case of subcontracting the competences, responsibilities and interfaces in the contractual relationship between the purchaser/client and the subcontracted company must be clearly defined.

(Revision 3)

3. Personnel requirements

3.1 Proof of competence for level 1 and 2

The proof of competence according to EN 17460, Annexes A and B, is carried out with a training and examination according to the level 1 (Comprehensive, EAE examination) and level 2 (specific, EAS examination) according EWF-system (training by approved training body and examination by the authorized nominated body).

(Revision 2)

3.2 Change of ABC

If the personnel requirements regarding the ABC of EN 17460 are no longer fulfilled, the certification body shall be informed immediately. The certification body then checks to what extent the certificate is adapted, suspended or withdrawn. (Revision 3)

3.3 Appointment of an ABC in training

For a transition period, persons who are undertaking level 1 or level 2 training can also be appointed as ABC if the training already has started by the time of the company audit.

In this case, the period of validity of the certificate must be limited to this transition period, until the ABC is qualified.

(Revision 3)

3.4 Competence level of the deputy

According to EN 17460, Annex A, at least a minimum of one rABC and one deputy must be appointed by the company. If the permanent availability of the rABC is not necessary, a person with a lower competence level may be appointed as deputy. However, it must be ensured that in this case the deputy may only make bonding decisions within the scope of his own competence level.

A deputy without competence level can only be appointed for the scopes pre-production and purchasing and A3-in-production/-post-production if it is ensured that no bonding activities or decisions are made in the absence of the rABC.

(Revision 3)

3.5 External supervision

In EN 17460 it is written "In case of subcontracting, an external rABC/d of the ordering company shall not work for the subcontracting party." That means in case of subcontracting, an ABC of the subcontracted company (supplier/order taking company) shall not be appointed as an external ABC for the ordering company (purchaser) at the same time. This is to prevent a conflict of interests.

That means in case of subcontracting, an internal ABC of the ordering company (purchaser) can be appointed as an external ABC for the subcontracted company (supplier/order taking company).

If the contracting company and the subcontractor are affiliated companies (e.g. holding company or other affiliated legal entities), this conflict of interest does not exist and there is no external supervision in this sense.

(Revision 3)

3.6 Numbers of companies where a rABC is appointed

According to EN 17460 the company shall ensure and demonstrate that the external rABC is available as necessary to fulfil his tasks. This refers specifically to the possibility of supervising several companies. A sufficient possibility to fulfill the tasks is given if the person is appointed in a maximum of 2 3 companies.

Exceptions may be accepted in the scopes pre-production, post-production, subcontracting and purchasing.

(Revision 3, 4)

3.7 Appointment of owners, managing directors etc.

According to EN 17460, Appendix A (A.2), the company owner, managing director, operations manager, or production manager may be appointed as ABC in case of small-scale adhesive bonding work.

This requirement does not have to be fulfilled by companies that have such a small staff size that a person independent of these persons could not be appointed as supervisor.

The “small scale” number of 50 parts is only informative.

(Revision 3, 4)

3.8 Further training of the bonding personnel

As a guideline for continuous further training, adhesive bonding operators should have 4 h to 8 h training and ABC 8 h to 16 h training. The complexity of the tasks, the responsibilities of the personnel in the bonding process and the scope of application should be considered. Justification must be given for shorter duration.

The date, duration, content and lecturer must be traceable.

(Revision 3)

3.9 Supply of temporary workers (Employee leasing)

Temporary workers for bonding work (temporary employment, leased staff, contractor worker) are subject to the same qualification requirements as permanent staff. Temporary employment is involved if the employee is subject to the hirer's right to issue instructions.

As soon as the product liability is taken over by an external company for which the employee works, it is a matter of subcontracting in accordance with EN 17460.

(Revision 3)

3.10 Proof of competence of level 3 for ABC

For ABC level 3 this has to be carried out with a training and examination according to the level 3 (basic) according EWF-system (EAB Diploma, training by approved training body ATB and examination by the authorized nominated body ANB).

(Revision 4)

4. Requirements of adhesive bonding processes

4.1 Bonded joints without safety requirements (class Z)

Adhesive joints without safety requirements (class Z) are to be classified in a comprehensible way; there are no further requirements on the part of the standard or the certification procedure.

(Revision 3)

4.2 Working instructions in case of class A3

According to EN 17460:2022, chapter 6.3, the rABC evaluates the need of work instructions for class A3 and Z. Work instructions for class A3 bonding must be provided in any case.

(Revision 3)

4.3 Adhesive bonding work at another company or site

When carrying out class A1 and A2 adhesive bonding work at a site of another certified company, a minimum level 2 ABC is required on site.

(Revision 3)

5. Requirements for technical equipment and infrastructure

5.1 Handling of release agents

In areas where classified adhesive bonded joints are produced or repaired, only pasty silicone adhesives, lubricants and sealants as well as cured silicone materials are permitted if it can be ensured that there is no risk of carry-over. Liquid silicones are prohibited in these areas.

Silicone-free release agents, such as PTFE-spray, are only permitted if a risk of carry-over into the bonding area can be excluded.

(Revision 3)

6. Miscellaneous

6.1 Test laboratories

Companies or laboratories who offer services for testing bonded joints, design validation, processing properties and process monitoring must demonstrate their suitability for these tasks (e.g. a certificate of competence like an accreditation EN ISO/IEC 17025).

If no official certificate of competence is available, the user-company must check the following criteria when commissioning a test laboratory to test specimens for classified bonded joints:

- Personnel (organization structure / responsibilities of those undertaking the testing work / certification of personnel operating testing equipment, certification in the area of adhesive bonding (e.g. for own specimen preparation))
- Testing equipment (regular monitoring, testing using own and other guidelines, report preparation, traceability of the data)
- Workplace conditions (cleanliness, climate, limitations on access)
- Management of samples and products that are provided.
- Management and traceability of reports

Alternative to an audit by the company it is possible for a test lab to be assessed by a certification body which is member of the ECARV with regard to these points, which then issues a corresponding certificate of competence.

(Revision 3)

7. Company audits / certification

7.1 Coexistence phase of the standards DIN 6701 and EN 17460

Both standards and thus also the respective certificates are to be considered equivalent in the 3-year coexistence phase. The DIN 6701 series of standards will be withdrawn in September

2025. For the coexistence phase, the certificates according to DIN 6701 and EN 17460 are considered equivalent.

The Certification Bodies are requested to obtain accreditation according to EN 17460 at the next regular assessment by the national accreditation body. Until then, the Certification Bodies can certify in the non-accredited area according to EN 17460.

(Revision 2, 3)

7.2 Application for issue of a certificate

For the homologation and surveillance an application as shown in Annex 1 is needed, together with a business description. The certification body must check that the application complies with the requirements of EN 17460 and this guideline. The application of this A-Z-Guideline is mandatory for certified companies.

(Revision: 2)

7.3 Example of a bonded joint

During company audits in the areas of production and maintenance and repair, companies must produce at least one bonded joint of the applied class. This shall be agreed with the certification body in advance. When commissioning third parties, sample bonding may be waived at the discretion of the certification body.

(Revision: 2)

7.4 Scope of the company audit

For company audits, the quality requirements on user-companies must be reviewed using table A1 "Duties of Adhesive Bonding Coordinators" of EN 17460.

The auditing is carried out on the basis EN 17460 with Annexes A, B and D (these Annexes are mandatory).

Company audits will be carried out randomly on selected applications or processes.

The scope of a company audit may include:

- Details on the application for certification and company description;
- Knowledge and understanding of generally accepted engineering practice (EN17460, other standards, guidelines, and technical bulletins);
- Company organization, authorities, responsibilities, rules for deputizing;
- Technical discussions with all ABC, qualifications of the employees, further training;
- Specifications, list of requirements, purchasing, sales, subcontracting;
- Classification, design, sizing, calculations, project planning, planning; documentation and verification;
- Production, repairs/maintenance, Production conditions, workplace;
- Storage and logistics, incoming goods inspection;
- Production documents, work instructions;
- Quality assurance, testing, work specimens;
- Traceability;
- Measuring equipment monitoring.

(Revision: 2, 4)

7.5 Surveillance

During the term of validity of the certificate the certification body supervises the company.

A minimum of one surveillance audit by the certification body is obligatory. In some cases, additional monitoring may be undertaken.

The execution of a surveillance audit has the same quality standards as the certification audit, although it usually takes only half the time.

The company bears the costs of the monitoring audit in accordance with the relevant fees of the certification body.

(Revision: 2)

7.6 Reports

The certification body is obliged to forward the audit reports to the company. The forwarding of partial or incomplete reports is not permitted, neither is the passing of reports to non-authorized third parties.

(Revision: 2)

7.7 Details on the certificate

The details on the certificate must correspond to those given on the example of the certificate in Annex 2.

(Revision: 2)

7.8 Validity of the certificate

The certificate is valid for the site of the user-company, the scope (class and code), specified ABC and is bound by any restrictions on the certification.

The certificate is valid for a maximum of three years.

In reasoned cases, the certification body can make the validity of the certificate subject to different requirements (e. g. use of other ABC, other testing, use of other personnel to undertake the bonding work, additional quality assurance tests, production monitored by the certification body).

(Revision: 2)

7.9 Scope (Code) of validity

Within the certified classes (A1, A2, A3), unless otherwise indicated on the certificate, the scope of validity is not restricted to certain assemblies or parts.

The specification of the scope of validity must be entered in accordance with the code table (see Annex 3).

(Revision: 2)

7.10 Changes during the period of validity

The certification body must be informed immediately if there is a change to the company address, class of certificate, ABC, adhesive bonding area and deliberate change or addition to the “main function of the bonded joint”. After the certification body checks the situation, the certificate is changed accordingly.

The certification body must be informed if there is a change or addition to any of the areas for which the certificate is valid: “pre-treatment methods”, “production processes”, “test methods”,

“degree of mechanization” and if there are changes to main processes. The certification body decides whether to check the changes on-site and whether it is necessary to change the certificate.

(Revision: 2)

7.11 Revoking certificates

The certification body can revoke a certificate if:

- there are serious shortcomings, which are not immediately rectified, in the execution of the adhesive bonding work that falls under the EN 17460;
- there are serious shortcomings with the supervision of the adhesive bonding work that falls under EN 17460;
- an appointed rABC or ABC is no longer present/available;
- there is no valid proof of the qualifications of the personnel carrying out the adhesive bonding work as specified in EN 17460;
- other requirements laid down in the EN 17460 are no longer fulfilled;
- the period of validity has expired;
- the user-company resigns the certificate.

(Revision: 2)

7.12 Short form of the certificate (deed)

If desired a short form of the certificate will be issued to the company. This is only valid in conjunction with the certificate. The short form excludes all personnel informations of the official certificate (like ABC).

(Revision: 2)

7.13 Online register

The certification bodies are obliged to keep details of the issued certificates in an online register (<https://www.en17460.com>). The certificates are automatically no longer displayed 90days after the expiry date (but are not deleted).

(Revision: 2)

7.14 Audit adjournment

In principle, it is not possible to extend the validity of a certificate. In exceptional cases, if timely agreement of an audit date is not possible, a certificate can be extended for a maximum of 3 months without a company audit. The company is informed of this in writing. The new expiry date of the certificate must be entered in the online database. The validity of the new certificate shall be reduced by the amount of time overrun. The validity of two consecutive certificates is therefore six years.

(Revision: 2)

7.15 Approved areas for adhesive bonding activities

There must be a list of areas for adhesive bonding activities (class A1, A2, A3) approved by the rABC. The designation of the bonding areas in the certificate is reserved to the certification body.

(Revision: 2, 3)

7.16 Number of auditors

For the following scope of combinations two auditors are mandatory for testing at initial certification, recertification audits and extension audits:

- manufacture + product design, at class A1
- maintenance and repair + product design, for class A1

For all other combinations for bonding class A1, as well as for all scopes and their combinations of classes A2 and A3 one auditor is intended. For audits of companies with small-scale bonding work also one auditor is intended, regardless of the scope and class. In surveillance audits one auditor is provided in each case.

(Revision: 2)

7.17 Escalation in the event of failure to remedy deviations by the deadline

In the case of first certification and recertifications, certificates can be issued for a limited period of time to enable companies to obtain a certificate despite non-critical deviations. These non-critical deviations must then be implemented by the defined date; the certificate can then be extended for the full term if the recheck of non-critical deviations is positive.

In the case of surveillance audit, the non-critical deviations must also be implemented by the company accordingly. If the defined time to remedy these deviations is exceeded, the certificate body is entitled to suspend the certificate or to shorten the duration of the certificate.

(Revision 2)

7.18 Submissions

Submissions on certifications or certification procedures (e.g. objections or complaints) as well as on the decisions of the A-Z-Guideline can be sent to the ECARV at the e-mail address 'ecarv@en17460.com'.

(Revision 2)

7.19 Commissioning of third parties with services of the process steps design a process planning

The procurement of design services and process planning is assigned to the process step commissioning of third parties. The required specification for the commissioning of third parties is to be released by a ABC of the commissioning party. If further bonding-related services are subcontracted, the responsibilities are to be clearly regulated.

The adhesive bonding competence must also be demonstrated in accordance with the requirements of the standard if manufacturing or repair work is commissioned and the commissioning party having no own workshop or no own personnel capacities.

Adhesive bonding competence must also be demonstrated in accordance with the requirements of the standard if manufacturing or repair work is commissioned and the commissioning party does not have its own workshop or personnel capacities.

(Revision 2)

Application

for the issuance of a certificate for adhesive bonding of rail vehicles
and parts in accordance with EN 17460

For the attention of: *[Certification body]*

company:

street, no.:

ZIP code, town,

http://

contact:

phone:

E-mail:

The application is being made for the production facility (only specify if different from above):

street, no.:

ZIP code, town,

Application for certification for the following areas:		class
<input type="checkbox"/>	Pre-production: product design of adhesive bonding	
<input type="checkbox"/>	Pre-production: process design of adhesive bonding	
<input type="checkbox"/>	In-production: manufacture	
<input type="checkbox"/>	Post-production: maintenance and repair	
<input type="checkbox"/>	Purchasing, sale and assembly of adhesively bonded components	
<input type="checkbox"/>	Sub-contracting	

Application:

- ☐ First application
- ☐ Follow-up application (Recertification), expiry of current certificate on:
- ☐ Due to change of the following requirements:

Have you already been certified in accordance with DIN 6701 / EN 17460 by another certification body?

- ☐ Yes (please state the certification body):
- ☐ No

Responsible Adhesive Bonding Coordinator (rABC):

First name, name:

Date of birth:

Contact (E-Mail address and phone) of rABC:

Competence level of adhesive bonding:

- ☐ Level 1, European adhesive engineer (EAE)
 - ☐ Level 2, European adhesive specialist (EAS)
 - ☐ Level 3, e. g. European adhesive bonder (EAB)
 - ☐ none / under education / application for education is available
 - ☐ the rABC is an „external“ person
- If the rABC is external: he is also supervisor in following companies/sites:

Adhesive Bonding Coordinator (first Deputy ABC):

First name, name:

Date of birth:

Contact (E-Mail address and phone) of the ABC:

- ☐ the ABC of the supervisor in charge of adhesive bonding has equal rights (otherwise „no equal rights“)

Competence level of adhesive bonding:

- ☐ Level 1, European adhesive engineer (EAE)
 - ☐ Level 2, European adhesive specialist (EAS)
 - ☐ Level 3, e. g. European adhesive bonder (EAB)
 - ☐ none / under education / application for education is available
 - ☐ the deputy of the rABC is an „external“ person
- If the deputy is external: he is also supervisor in following companies/sites:

The company

- declares to observe the standard EN 17460 (with Annex A, B and D) and the applicable technological standards,
- agrees that details will be published in the online register EN 17460 (company, scope of application, classes, code, remarks).
- Consents to the processing of ABC details (name, date of birth, qualification) in the online register -but these details will not be published-.
- accepts the rules of the ECARV (A-Z-Guideline),
- accepts the necessary surveillance by the certification body for the period of validity,

Declaration of liability of applicant

By handing in the fully signed and stamped application form to the Certification Body, the applicant declares that his declaration is binding. After examining the application, the Certification Body declares acceptance if all the necessary conditions are met, which leads to the effective conclusion of the contract with the applicant.

From this point in time, the Certification Body is deemed by the applicant to be to carry out all steps and processes required for the issue of a certificate according to according to EN 17460.

(Place, date)

(Stamp, name and signature of applicant)

Please enclose:

- General description of the company
- Organizational scheme (with identification of rABC's position in the company)
- Description of adhesive bonding work (including assembly and classes)
- List of further ABC (including their tasks and responsibilities)

Appendix 2 – Certificate form

<u>Certificate</u> <u>in accordance with EN 17460</u> <u>Railway application – Adhesive bonding in</u> <u>rail vehicles and their components</u>	Logo Certification body in accordance with EN17460
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The production facility at **XXX**
of the company **XXX**

has been certified to carry out adhesive bonding work for

~~Product design of adhesive bonded parts~~ **Class A(X)**
~~Process design of adhesive bonded parts~~ **Class A(X)**
~~Manufacture of adhesive bonded parts~~ **Class A(X)**
~~Maintenance and repair of adhesive bonded parts~~ **Class A(X)**
~~Purchasing, trading and assembly of classified bonding parts~~ **Class A(X)**
~~Subcontracting for adhesive bonded parts~~ **Class A(X)**

in accordance with **EN 17460**

Scope of validity

Main function of the bonded joints: **XXX**
Pre-treatment methods*: **XXX**
Production methods*: **XXX**
Test methods*: **XXX**
Degree of mechanization*: **XXX**

* From the code table in Annex 3 to the A-Z-Guideline

Responsible Adhesive Bonding Coordinator (rABC): **XXX**

Adhesive Bonding Coordinator (ABC) with equal rights: **XXX**

Adhesive Bonding Coordinator (ABC) with not equal rights: **XXX**

Remarks: *- s. reverse*

Certification no.: *Certification body/17460/class/N,F/year/no*

Issued on: *dd/mm/yyyy*

Change on: *dd/mm/yyyy*

Valid until: *dd/mm/yyyy*

This document is only valid in combination with the actual registration of the certificate in the Online-Register

(Head of certification body, name, signature and stamp)

Remarks

General Regulations

The new application has to be submitted to the certification body at least **three months** before the certificate expires if the suitability of the user-company shall be certificated furthermore.

Changes within the time of validity of the certificate

If the address of the user-company or company site, the class of the certificate, supervisors or the area of validity change, the certification body must be informed immediately. The certification body decides about the necessity of an inspection on the site and change of the certificate.

The certification body must be informed if there are changes or additions to main processes or to any of the areas for which the certificate is valid under "pretreatment methods", "production processes", "test methods" and "degree of mechanization". The certification body decides whether to check the changes on-site and whether it is necessary to change the certificate.

Withdrawal of the certification

Authority or the certification body can withdraw certification if:

- 1) There is a serious shortcoming in the execution of the adhesive bonding work as required by this standard;
- 2) There is a serious shortcoming in the supervision of the adhesive bonding work required by this standard;
- 3) There is no authorized supervision of the adhesive bonding work;
- 4) The employees carrying out the adhesive bonding work at the practical level do not have valid qualification certificates as required by this standard;
- 5) Other conditions required by this standard are no longer fulfilled;
- 6) The period of validity has expired;
- 7) The user-company does not have certification.

The user company must confirm attention of the withdrawal in written form towards the certification body.

Appendix 3 – Code table

Group	Description	Code
Main function	Force transfer using high-modulus adhesives	F
	Balancing of substrate deformation using low-modulus	D
	Sealing	S
	Bonding large areas (lamination)	L
	Others (please describe):	
Surface pre-treatment	Blasting	BL
	Etching, Anodisation	ET
	Plasma treatment (LP plasma, AP plasma, corona, flame	PL
	Laser treatment	LS
	Others (please describe):	
Production methods	Processing of solvent or water based systems (primers,	SO
	Processing of 2-C adhesives	TK
	Processing of 1-C moisture/humidity activated systems	HU
	Processing of heat-curing adhesives	HE
	Processing of hotmelt adhesives	HM
	Processing of radiation-curing adhesives	RA
	Processing of anaerobically curing adhesives	AN
	Lamination or processing of pressure sensitive adhesives	LA
	Others (please describe):	
Test methods	Destructive test methods	DT
	Non-destructive test methods	NDT
	Visible inspection (with test instructions)	VIS
	Application monitoring with electronic data processing	DC
	Tests with dynamic mechanic loads (fatigue)	CY
	Crash/impact tests	IM
	PhySiCal-chemical ageing tests (e. g. climate test, UV, salt,.)	PC
	Rheology measurements	RH
	Spectroscopic analyses (e. g. IR, UV-VIS, ...)	RS
	Thermal analysis methods (DSC, DMA, TGA, etc.)	TA
	Wetting tests	WT
	Others (please describe):	
Mechanization level	Fully mechanized/automated	VM
	Partly mechanized	TM
	Manual	M

