CERTIFICATION SCHEME FOR WELDING OF RAILWAY VEHICLES AND COMPONENTS

DOCUMENT CWRVC/1: SCHEME DESCRIPTION AND BENEFITS

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Issued under the authority of the Governing Board for Certification
All correspondence should be addressed to:

TWI Certification Ltd
Granta Park
Great Abington
Cambridge CB21 6AL
United Kingdom

Tel: +44 (0) 1223 899398
Fax: +44 (0) 1223 894219
Email: companycertification@twi.co.uk
Web: www.en15085.org

CWRVC is administered by TWI Certification Ltd
The use of the UKAS Accreditation Mark indicates accreditation in respect of those activities covered by Accreditation Certificate No 25

1 GENERAL BACKGROUND

In quality terms, welding is identified as a 'Special Process' in the manufacture of railway vehicles and their components. The requirements for this process are described in the standards series EN ISO 3834.

This scheme sets the requirements, processes and procedures for assessment of manufacturers of railway vehicles and their components by welding for compliance with and certification in accordance with BS EN 15085-2.

2 OUTLINE OF THE CERTIFICATION SCHEME FOR WELDING OF RAILWAY VEHICLES AND COMPONENTS (CWRVC)

BS EN 15085 applies to welding of metallic materials in the manufacture and maintenance of railway vehicles and their parts. It defines certification and quality requirements for the welding manufacturer to undertake new manufacture and repair work. BS EN 15085 consists of the following:

BS EN 15085 Railway applications – Welding of Railway Vehicles and Components
Part 1: General
Part 2: Quality Requirements and Certification of Welding Manufacturer
Part 3: Design Requirements
Part 4: Production Requirements
Part 5: Inspection, Testing and Documentation

Part 2 of these documents also make reference to BS EN ISO 14731 Welding Co-ordination, Tasks and Responsibilities.

The scheme is administered by the Welding Fabricator Certification Management Committee (WFCMC) on behalf of the Governing Board of TWI Certification Ltd.

Companies which meet the requirements of the Scheme are entered onto the Register of Certified Companies webpage. All registered companies receive a CWRVC Certificate and are able to use the scheme logo.

3 BENEFITS FOR REGISTERED COMPANIES

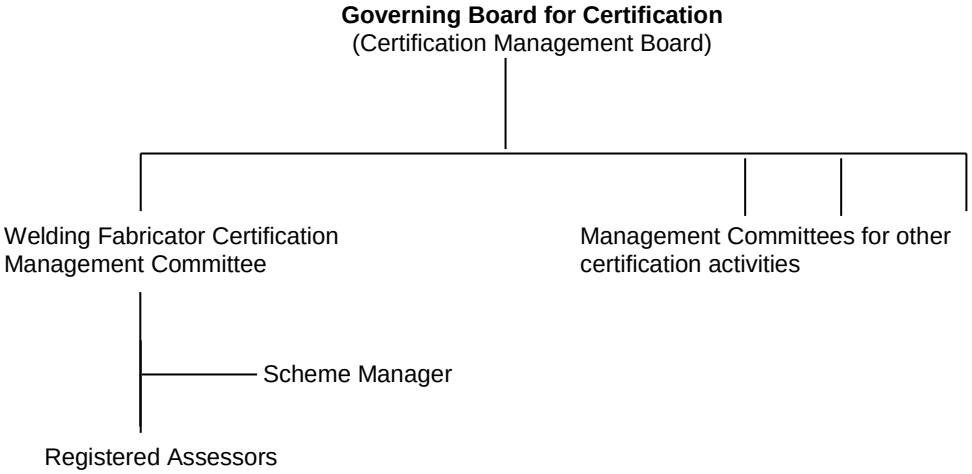
- Clear, high profile independent verification of its compliance with BS EN 15085 and UKAS requirements.
- Independent confirmation of competence for its welding and fabricating capabilities and staff in a defined scope of activity.
- Welding quality management and fabrication capability assessments carried out by specialist assessors registered by TWI Certification Ltd.
- Increased national and international business potential through demonstrated compliance with internationally recognised welding quality requirements.
- On request, European Committee for Welding of Railway Vehicles (ECWRV) membership

4 BENEFITS FOR CLIENTS OF REGISTERED COMPANIES

- Expertly led, independent, vendor assessment.
- In-depth, authoritative evaluation of the manufacturer's capability.
- Consistent assessment.
- Uniform presentation of information and data.

5 ORGANISATIONAL STRUCTURE

The certification management structure of TWI Certification Ltd is as follows:



6 SCHEME OPERATION

Applicant companies are audited by assessment teams specifically approved by the Scheme Manager. Assessors have proven railway welding knowledge and experience, and this ensures that assessment is expertly directed and that the results are authoritative.

Following assessment of the applicant company, the Lead Assessor reports the findings and the results to the Scheme Manager. If successful assessment and approval is given, the data will be entered onto the Register of Certified Companies and ECWRV register, if this is a customer requirement. Registered companies are issued with a CWRVC Certificate.

7 LEVELS OF CERTIFICATION

Certification Level (CL)	Description
CL 1	Welding manufacturers which manufacture welded parts with joints classified in weld performance classes CP A to CP D
CL 2	Welding manufacturers which manufacture welded parts with joints classified in weld performance CP C2 to CP D. Welded joints classified in weld performance class CP C1 are included if these welds are checked according to welding inspection class CT 1 according to EN 15085-5:2007. Certification level CL 4 is only included according to welded joints of certification level CL 2 or CL 3
CL 3	Welding manufacturers which manufacture welded parts with welded joints classified in weld performance class CP D
CL 4	Manufactures who do not weld but design railway vehicles and parts of rail vehicles or buy and assemble or sell them. Certification not required for welding works of certification level CL 3.

8 STEPS TO CERTIFICATION

The process for applicant companies involves the following stages:

a) Submission of the application form to TWI Certification Ltd.

b) Customer returns the Assessment Questionnaire, RWC Summary Report, and the Roles and Responsibilities of the Welding Coordinators to TWI CL,

b) Appointment/approval of Assessment Team by Scheme Manager.

c) Preliminary assessment by the Lead Assessor to establish quality system status and scope and complexity of welding company facility [On-site or conducted remotely]

d) Document Review completed by the Lead Assessor from the assessment documentation returned by the company.

e) Planning of the assessment by Assessment Team

f) Initial assessment is carried out by the approved Assessment Team. During the assessment, one-to-one discussions with shop floor personnel during the workshop walk around will be conducted, discussions will also be held during the assessment with the welding co-ordination personnel. Verification of company capability shall be obtained during the assessment process.

9 CERTIFICATION AND REGISTRATION OF APPLICANT COMPANIES BY TWI

a) **Registration**

Lead Assessor will submit all relevant information to the Scheme Manager for inclusion on the Register. This may include the following information:

- Current product range
- Welding processes
- Materials and thickness ranges
- Forming, machining and cutting facilities
- NDT facilities
- Heat treatment facilities
- Maximum handling size and weight
- Transportation limitations
- Personnel
- Welding co-ordination personnel
- Training facilities
- Sub-contracting (relevant to fabrication)
- Major use and control of sub-contractors
- Special equipment/techniques available.

This information will be publicly available.

b) **Certification**

A company, which has demonstrated compliance with these requirements, shall be issued with a CWRVC Certificate identifying the relevant information.

c) **Surveillance of Registered Companies**

Surveillance visits will be performed at least once each year so that the Company can demonstrate ongoing compliance with the appropriate part of the standard. Desktop surveillances (no site visit), after the first year of surveillance assessment may be granted to customers with exceptional record, no corrective actions and no changes since the previous visit to their processes, materials, equipment, personnel, location etc.

d) **Reassessment**

Reassessment against BS EN 15085 is every three years.

10 NOTIFICATION OF CHANGE OF CAPABILITY

The Registered Company shall notify the Scheme Manager immediately when there is any reduction in the facilities or capabilities assessed. Changes of welding co-ordination personnel shall be notified and any new appointees' documentation will be reviewed for adequacy.

11 SCHEME DOCUMENTATION

CWRVC/1 Scheme Description and Benefits

12 FURTHER INFORMATION

TWI Certification Ltd
Granta Park
Great Abington, Cambridge CB21 6AL, UK
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Appendix 1 – Annex A from EN 15085-2:2007

Possible Allocation of Parts and Subassemblies of Railway Vehicles to the Certification Levels

Certification Level	Parts classification
Level CL 1	New build, conversion and repair of rail vehicles and their components Examples of components: • bogies (headstock, solebars, cross bearers, bogie frames); • underframes (extensions, solebars, cross bearers, assembly); • vehicle body (front walls, side walls, roof); • draw and buffing gear; • supporting frames for external equipment parts (e.g. tanks, electrical, air-conditions and compressed air containers) • wheelset mountings, axleboxes, spring supports, shock absorbers, vibration dampers; • brake equipment (magnetic track brake, brake rods, brake triangles, brake cylinders, brake cross beams); • supporting frames for heavy duty vehicles including road/rail vehicles; • welded components for drag transmission from bogie to vehicle (bolster); • fuel tanks of vehicles; • finishing welding of castings within components indicated above; • pressure gas tanks, tanks and tanks containers of rail vehicles with test pressure a; • containers for dangerous materials[a].
Level CL 1 or CL 2	New build, conversion and repair of rail vehicles and their components, depending on the weld performance class (CL 1 only for CP A, CP B or CP C1), eg: • entrance doors, end doors; • self-supporting equipment boxes and underfloor containers (fresh water and waste-water containers); • external machine equipment parts (transformer, engine, transmission suspension); • roof construction(pantograph, panelling); • machine room equipment (transformer casing, transformer suspension, engine suspension, transmission suspension, attachment for traction motor, instrument racks); • power transmission parts (traction coupling, cardan shafts); • traversers (ie car wagon); • turning and tipping equipment; • obstacle deflectors; • stanchions and lashing rings • compressed-air reservoirs for rail vehicles [a]; • Pressurised pipes.
Level CL 2	New build, conversion and repair of non-pressurised containers without special test pressure, eg: • payload container for non-dangerous materials; • other transport containers. New build, conversion and repair of structural parts for rail vehicles, eg: • internal parts of passenger coaches (partitions, walls, doors, panelling); • supporting frame for internal parts (electrical, air-conditioning and compressed air installations); • driving cab equipment; • lavatory parts and water containers with installation; • sliding doors in vehicles including runways; • fastenings for bake pipes; • non-self supporting equipment boxes underneath the base frame (without supporting frame); • gearboxes and consoles for hand brake operation;

	• steps, hand rails (including handrails in entry areas) and railings external to the vehicle.
Level CL 3	New build, conversion and repair production of simple attached parts for ail vehicles eg: • cranks and levers for various operations; • striking plates; • equipment boxes and switch cabinets in rail vehicles (including gearboxes and consoles for hand brake operation, without supporting frame); • holders for index plates; • wheel scotches; • covers for freight wagons (heat protection on tank wagons); • steps, handrails, railings on rail vehicles. New build, conversion and repair of parts or trade supply parts of rail vehicles for instance: • seating frames; • window frames; • ventilation grilles.
Level CL 4	This certification level is valid for manufacturers that do not carry out their welding fabrication if welded components and parts are: • designed; • bought and assembled.
a The requirements of this standard will be superseded by specific product standards, e.g. EN 286 air reservoirs.	

Appendix 2 – Annex B from BS EN 15085-2:2007
Tasks and Areas of Competence of the Welding Co-ordinator

Tasks are areas of competence of the Welding Coordinator		Welding Co-ordinator		
Related Clause from EN ISO 14731:2006 Annex B	Tasks and areas of competence for rail vehicle building	Level A	Level B	Level C
B.1 Review of requirements	- product standard to be used, together with any supplementary requirements	X	(X)	(X)
B.2 Technical review	- parent material(s) specification and welded joints properties	X	(X)	(X)
	- joint location with relation to the design requirements	X	X	(X)
	- requirements for weld performance class	X	(X)	(X)
	- location, accessibility and sequence of welds, including accessibility for inspection and non-destructive testing	X	X	(X)
	- other welding requirements, eg batch testing of consumables, ferrite content of weld metal, ageing, hydrogen content, permanent backing, use of peening, surface finish, weld profile	X	(x)	-
	- dimensions and detail of joint preparation and completed weld	X	X	(X)
B.3 Sub-contracting	With regard to sub-contracting, the suitability of any sub – contractor for welding fabrication shall be ensured.	X	(X)	(X)
B.4 Welding personnel	With regard to welding personnel, the qualification of welders and welding operators shall be carried out (including training, instruction, performance and assessment)	X	X	(X)
B.5 Equipment	The suitability of welding and associated equipment shall be ensured	X	X	(X)
B.6 Production planning	- reference to the appropriate procedure specifications for welding	X	X	X
	- allocation of qualified personnel	X	X	X
B.7 Qualification of the welding procedures	- method and range of qualification with regard to the qualification of the welding procedures	X	(X)	-
	- performance and assessment of welding procedure qualification	X	X	-
B.8 Welding procedure specifications	With regard to welding procedure specifications, the range of qualification shall be determined	X	(X)	(X)
B.9 Work instructions	With regard to work instructions, the issuing and use of work instructions shall be determined	X	(X)	(X)
B.10 Welding consumables	- compatibility	X	X	X
	- delivery conditions	X	(X)	(X)
	- any supplementary requirements in the welding consumables purchasing specifications, including the types of welding consumable inspection document	X	(X)	(X)
	- storage and handling of welding consumables	X	X	(X)
B.11 Materials	- any supplementary requirements in the material purchasing specifications, including the types of inspection document for the material	X	(X)	(X)
	- storage and handling of the parent material	X	X	X
B.12 Inspection and testing before welding	- suitability and validity of welder's and welding operator's qualification certificates	X	X	(X)
	- validity of the welding procedure specification	X	(X)	(X)
	- identity of the parent material and welding consumables	X	X	X
	- joint preparation, fit-up, jigging and tacking			
	- any special requirements in the welding procedure specification (eg prevention of distortion)	X	X	X
	- Suitability of working conditions for welding, including the environment	X	X	X
	- Performance and assessment of mock-ups	X	X	(X)

Tasks are areas of competence of the Welding Coordinator		Welding Co-ordinator		
Related Clause from EN ISO 14731:2006 Annex B	Tasks and areas of competence for rail vehicle building	Level A	Level B	Level C
B.13 Inspection and testing during welding	- essential welding/parameters - preheating/interpass temperature - cleaning and shape of runs and layers of weld metal - back gouging - welding sequence - correct use and handling of welding consumables	X X X X X X	X X X X X X	X X X X X X
B.14 and B.15 Inspection and testing after welding	- use of visual inspection - use of non-destructive testing - use of destructive testing - results and records of post operations (eg post-weld heat treatment, ageing)	X X X X	X (X) (X) (X)	(X) - - (X)
B.16 Non-conformance and corrective actions	With regard to non-conformance and corrective actions, the necessary measures and actions (eg weld repairs, re-assessment of repaired welds, corrective actions) shall be determined	X	(X)	(X)
B.17 Calibration and validation of measuring, inspection and testing equipment	The necessary methods and actions shall be determined	X	X	(X)
B.18 Identification and traceability	The applicable actions shall be determined	X	(X)	(X)
B.19 Quality records	Preparation and release of the necessary welding records and documents	X	(X)	(X)

Key

X = fully authorised

(X) = for manufacturer with certification level CL2 and CL 3 fully authorised; for manufacturer with certification level CL 1 limited authorised with accordance after agreement with the responsible welding coordinator

- = not authorised.

APPENDIX 3 – ANNEX C from BS EN 15085-2:2007 – Requirements for the Welding Manufacturer

	Certification Level			
	Level CL1	Level CL 2	Level CL 3	Level CL4
Manufacturer Certification	Required	Required	Not required	Required
Weld performance class	CP A to CP D	(CP C1)[a], CP C2 to CP D	CP D	CP A to CP D
Quality requirements [b]	ISO 3834-2	ISO 3834-3	ISO 3834-4	ISO 3834-3
Welding Coordinator	Level A	Level B or C	No requirement	For: Level 1 welding work: Level A Level 2 welding work: Level B or C
Deputy of the Welding Coordinator	Deputy: Level A [c] Further deputies: Level B or C [d]	Deputy: Level C	No requirement	No requirement
Welders and operators	Depending on the welding process and material group, qualified welders or welding operators are required according to EN 287-1 (for steels), EN ISO 9606-2 (for aluminium) or EN 1418 (for welding operators)			Not relevant
Testing personnel	- Testing personnel for welding quality tests; - testing supervisors for welding quality tests: responsible welding coordinator (not for CL 3) - non-destructive testing personnel - testing evaluator for non-destructive testing: level 2 according to EN 473			Not relevant
Welding Instruction	WPS according to the relevant parts of EN ISO 15609 or EN ISO 14555 or EN ISO 15620			Not relevant
Welding Instruction	WPS qualified by WPQR the relevant parts of EN ISO 15610, EN ISO 15611, EN ISO 15612, EN ISO 15613, EN ISO 15614 [e] or EN ISO 14555 or EN ISO 15620 (for details see EN 15085-4) For CP D, only if specified in the contract		WPS qualified by WPQR only if specified in the contract	Not relevant

a See Table 1.
b The requirements of the relevant part of EN ISO 3834 shall be met, but no certification according to EN ISO 3834 is required.
c Level A deputy is not required for small welding manufacturers with a single welding shop.
d For welding manufacturers with several welding shops a further deputy, Level C, is required for each welding shop.
e For railway applications, only EN ISO 15614-1, EN ISO 15614-2, prEN ISO 15614-3, EN ISO 15614-4, EN ISO 15614-7, EN ISO 15614-11, EN ISO 15614-12 and EN ISO 15614-13 are relevant