



The **Product Certification Scheme** for Steel for the Reinforcement of Concrete

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Introduction



This Part, which is the first in a series, provides a detailed description of the CARES product certification scheme for reinforcing steel used in the UK and elsewhere since the 1980s – the Steel for the Reinforcement of Concrete (SRC) scheme. It outlines why it is needed now, more than ever, and how it is structured, managed and applied.

CARES is the leading independent, international, constructional steels product certification body. We deliver confidence in the performance, provenance and quality of safety-critical reinforcement products entering the construction supply chain. With a proud track record of providing assurance to users, designers, consultants and specifiers spanning four decades, our data-led inspection and certification services provide valuable transparency into the provenance and sustainability characteristics of constructional steels moving across complex global supply chains.

Clients and specifiers can specify CARES-approved reinforcement suppliers with confidence that the product will comply with the relevant reinforcement standard without the need for costly, on-site testing.

Clients in more than 45 steel-making nations use our profit for purpose certification services to secure the assurance and certainty that comes with a range of sector-leading schemes designed to build trust in the manufacture and fabrication of key materials sourced by private and public sector bodies.

Compliance with regulatory systems and product standards is inbuilt with CARES approval – and backed up by a seamless digital solution, the CARES Cloud, <https://cares.cloud> providing instant authentication of a supplier’s CARES certification and traceability to the origin of the reinforcing steel.



Download the CARES Cloud App



Why is product certification needed?



Trust in safety critical products has been seriously undermined by fake data scandals, such as those at Kobe Steel and VW, and major disasters such as the Grenfell Tower fire. Finding the truth of a product's provenance is never more needed than now – and reinforcing steel is one of the most safety critical elements in any project. It is important for buildings to be safe during construction and in operation, and that supply chains deliver certified products with the required performance and assurance evidence. The risks associated with non-certified constructional steel supply chains include:

- use of reinforcing steel not complying with the required Standards. Material arrives on construction sites that fails to meet all the requirements of the appropriate standard resulting in expensive additional testing and site delays
- misleading use and falsification of assurance evidence such as certificates of approval and material test certificates. Test certificates have been used to represent material from different sources to those stated and, in some cases, fraudulently altered to cover material that did not comply with the Standard
- excessive variability in mechanical properties, which in some cases have been seen to fall below the minimum required in the Standard
- lack of awareness of product marking systems, which provide identification of the manufacturer and other information. On occasions this has been a simple case of a failure to supply test certificates on time, in others there has been major differences between tender documents, purchase orders and client expectations

What is third-party product certification?



The aim of certifying products is to give confidence to all interested parties that a product fulfils specified requirements. Confidence and trust is established by an impartial and competent demonstration of the fulfilment of those specified requirements by an independent third party.

The CARES Steel for the Reinforcement of Concrete (SRC) scheme provides independent assurance of the consistency of product quality and, critically, gives the market a product that is traceable across the whole supply chain, ensuring that steel reinforcement products are effectively tested, certified, marketed and traced.

To provide this confidence, we believe successful product certification schemes comprise the following essential elements (see Figure 1):

1. Clear technical requirements and audit criteria. The technical requirements apply to the companies in the supply chain and state the product requirements to be satisfied. These are described in the CARES Steel for the Reinforcement of Concrete (SRC) scheme document. This document sets out the requirements which must be met and against which certification assessments are made. These are developed by highly-experienced technical committees with balanced representation from each of the stakeholder groups – Clients (public and private sector), Consultants, Contractors and Manufacturers. CARES' certification covers all stages in the supply chain from the processing of raw materials, the manufacture of steel, and the processing of the steel through to product installation or delivery to the customer.
2. Effective certification process. This ensures clear rules and procedures are consistently followed and documented to establish whether the technical requirements have been met or not, and is carried out by an independent, impartial and competent certification body.
3. Accreditation. This is the mechanism for ensuring that the organisations which undertake certification are competent and produce credible, consistent results, sometimes described as 'certifying the certifiers.' Accreditation is undertaken by an accreditation body, such as the UK Accreditation Service (UKAS) in the UK, to the relevant accreditation standard, ISO/IEC

17065:2012 - Conformity assessment - Requirements for bodies certifying products, processes and services.

4. Product claims. In addition, where the scheme is used as a basis for identifying certified products from approved manufacturers and for making product claims, then a mechanism for controlling these requirements needs to be in place to address:
 - a. Traceability: the material may go through many production and logistical stages between the manufacturer and the installation of the product. There must be a mechanism for tracing it from the approved manufacturer, through each stage, to provide certainty that the product about which the claim is being made is linked to an approved manufacturer. This process is often referred to as full product traceability. This is synonymous with an identify preserved chain of custody model according to ISO 22095 Chain of Custody – General Terminology and Models.
 - b. Claims and Labelling: any claims made on any labels or published elsewhere about a manufacturer – or a product – shall be clear, credible and evidence based. This requires a set of rules to be followed by those making claims or labelling products. The Construction Products Association's (CPA) Code for Construction Product Information (CCPI) was developed by the CPA's Marketing Integrity Group (MIG), set up after the Grenfell Tower fire in the UK exposed issues with the integrity of marketing of construction products. The CPA code sets a benchmark to address shortcomings in the presentation and marketing of product information. These issues were identified in criticisms made by Dame Judith Hackitt's 'Building A Safer Future' report, commissioned by the UK government in the wake of Grenfell – and the cladding scandal uncovered by the Public Inquiry into the tragedy. The CPA's code requires all product information to be clear, accurate, up-to-date, accessible and unambiguous.

Figure 1 - Essential elements of a credible product certification scheme



Management and administration of the CARES SRC scheme

To enable use in major specifications, including those of public purchasers, the management structure of CARES is accredited by UKAS to the international standard for independent third-party product certification bodies, ISO/IEC 17065. This standard requires important conditions for the acceptance of a certification body, vital in providing confidence to all parties in the value chain. It ensures:

Integrity

- Access to the service of the Product Certification Body is available to all
- There shall be no undue financial conditions to restrict participation
- Certification procedures must be administered in a non-discriminatory manner
- There shall be no single interest predominating in the governing board
- Permanent staff shall be free from control by those who have a direct commercial interest

Technical Competence

- Assessors of CARES are Registered Lead Assessors and are also experts in the products, processes and standards of the reinforcing steel industry
- The operation is managed by a team of highly competent technical and certification staff
- All independent testing is carried out by UKAS or equivalent accredited laboratories

Independence

- The active participation of organisations representing all interests in the building and construction industry who are willing to demonstrate a commitment to quality for the whole supply chain

CARES was issued with UKAS Accreditation Certificate 0002 and was the first certification body to be accredited for product certification.



How does a supplier achieve product certification to the CARES SRC scheme?

CARES assesses the capability of the supplier to provide products which consistently comply with the published standards (for example BS 4449, BS 8666, BS 4482 and BS 4483). CARES additionally uses ISO 9001 (Requirements for quality management systems) as criteria to determine compliance with the quality management system requirement of the scheme. The specific product conformity requirements are defined in the relevant standard. For example, the British Standard for reinforcing steel, BS 4449, has requirements for the long-term quality level of tensile properties. Where the steel is covered by a third-party product certification scheme, the verification of this statistical capability is covered by the scheme. Where material is not covered by such a scheme, BS 4449 specifies an extensive sampling and testing regime for each batch supplied.

CARES approval status is a continuous process over an annual cycle. Initial engagement helps determine if the scheme is appropriate for the manufacturer and if it is ready to apply. When confirmed, it submits an application. This is followed by a three-part assessment process:

1. Assessment of the applicant’s quality management system to ISO 9001 and system for maintaining full product traceability
2. Audit of compliance with the relevant CARES schedules which are based on the relevant product standard, grade and manufacturing process
3. Independent product testing to determine compliance with the relevant product standards.

The outcome of a satisfactory assessment and a positive certification decision is the issue of a CARES Certificate of Approval, with a closely defined scope of certification. A typical certificate of approval, as shown in Figure 2, states the name of the company, the factory to which the approval applies and the products covered, including size range (as appropriate).

Figure 2 - Certificate of Approval



Significant changes to the manufacturers system, process and product result in a re-assessment in order that approval can continue. Following approval of all types of manufacturers, processors and stockists, surveillance inspections are carried out at least twice annually.

Continued...



Product samples are selected by the CARES auditor and witness tested in the manufacturers' laboratory. Duplicate samples are also independently tested at selected accredited laboratories. CARES role is to check, amongst other matters, that the testing has been carried out correctly and consistently to the highest standards. If these audits demonstrate that the company continues to comply with the requirements of the CARES SRC scheme, a certificate of approval will be re-issued at the beginning of each year.

Identification of the manufacturer and traceability of the certified product

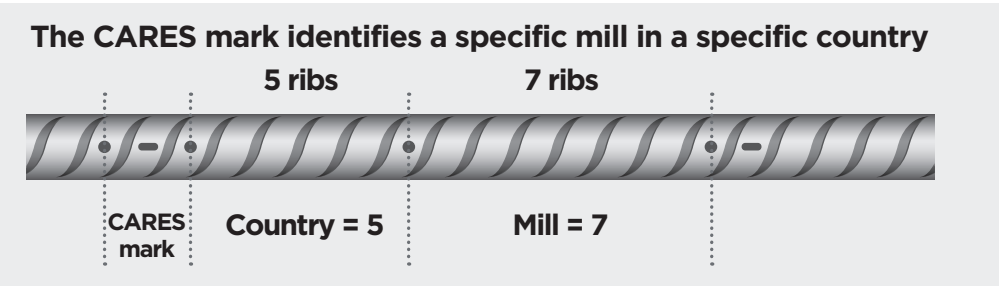
Traceability to both the manufacturer of the steel and to its specific production data, including test results, is of major importance. Reinforcement can be identified by the arrangement of ribs with dots or spaces between them.

The identification of country of origin is as follows:

UK, Ireland, Iceland:	5 ribs
Austria, Czech Republic, Germany, Poland, Slovakia:	1 rib
Belgium, Luxembourg, Netherlands, Switzerland:	2 ribs
France, Hungary:	3 ribs
Italy, Malta, Slovenia:	4 ribs
Denmark, Estonia, Finland, Latvia, Lithuania, Norway, Sweden:	6 ribs
Portugal, Spain:	7 ribs
Cyprus, Greece:	8 ribs
Other (non-European) countries include:	
China, Egypt, Nigeria, Russia, Saudi Arabia and Ukraine:	9 ribs

All CARES certified reinforcing steel is identified by rolling marks on the surface of the bar at intervals of <1.5m

Figure 3



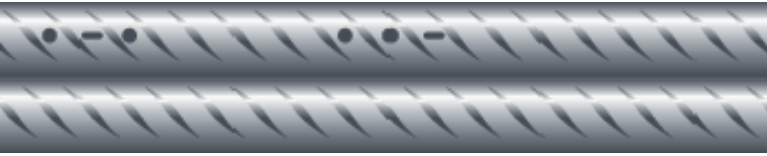
The bar mark rolled into each piece of reinforcement, as shown in Figure 3, indicates that the product is CARES certified. It comprises:

- the CARES certification mark
- the country
- the mill

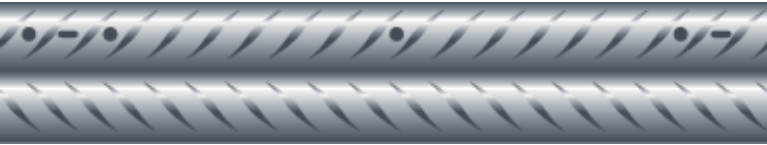
Note: The Dot-dash-dot denotes CARES certified steel

Figure 4 - Illustrative Rib patterns identifying ductility grades

Example rib pattern for grade B500A
For Grade A steel, the bars have two or more series of parallel transverse ribs with the same angle of inclination and the same direction for each series.



Example rib pattern for grade B500B
For Grade B steel, the bars have two or more series of parallel transverse ribs. For bars with two or three rib series, one of the series is at a contrary angle to the remainder; and for bars with four rib series, two of the series are at a contrary angle to the remainder.



Example rib pattern for grade B500C
For Grade C steel, the bars have the same rib series as Grade B. However, in each rib series, the ribs shall alternate between a higher and lower angle with respect to the bar axis (differing by at least 10°).



The importance of the CARES approved Fabricator (Processor)

The integration of each part of the reinforcement supply chain is key to achieving the full benefit of the CARES Scheme and therefore the reinforcement fabricator has a vital role to play in maintaining product conformance as delivered to the construction site. In the case of cutting and bending, product conformity is assessed by an assessment of the equipment, measurement of fabricated items and an inspection of the bent bars to ensure that no damage has taken place. Such processors must;

- Purchase from CARES approved reinforcement manufacturers
- Maintain a system enabling full traceability of cut and bent items back to cast information

- Comply with the requirements of the standard and customer specification regarding dimensional tolerances, former diameters, inspection, training and material handling
- Use the CARES logo and approval number on bundle labels and associated paperwork

All CARES approved fabricators operate a quality system which meets the requirements of ISO 9001 in relation to the processing of reinforcement to the British Standard, BS 8666. Failure to use such approved processors places the onus of product compliance squarely on the shoulders of the contractor.

Customer complaints

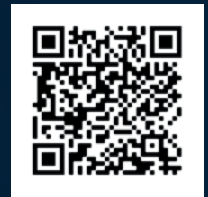
At quarterly intervals, each CARES approved firm, at each level of the supply chain, is required to submit to CARES, details of all customer complaints that have been received in relation to conformance of the products for which they are approved. CARES uses this information to assess the ability of the approved firm to

comply with customers' requirements as well as monitor trends throughout the entire supply chain. In addition, as an accredited third-party product certification body, CARES must operate a procedure that can deal with any complaint by a construction client or contractor against the performance of one of its approved firms.



Your guide to specifying Learn how to procure CARES certified steel products

specification
guide



To specify CARES certification that meets government and private sector quality assurance and responsible sourcing requirements on your project, use the suggested text from the CARES specification guide.

References

ISO/IEC 17065 available from:
<https://www.iso.org/standard/46568.html>

ISO 9001 available from:
<https://www.iso.org/iso-9001-quality-management.html>

BS 4449 available from:
<https://knowledge.bsigroup.com/products/steel-for-the-reinforcement-of-concrete-weldable-reinforcing-steel-bar-coil-and-decoiled-product-specification/standard>

BS 8666 available from:
<https://knowledge.bsigroup.com/products/scheduling-dimensioning-bending-and-cutting-of-steel-reinforcement-for-concrete-specification-1/tracked-changes>

ISO Committee for Conformity Assessment (CASCO) Report, February 2022, Misuse of third party marks of conformity available from:
<https://www.iso.org/publication/PUB100461.html>

Building a Safer Future:
Independent review of building regulations and fire safety
May 2018 Dame Judith Hackitt

Assured Steel Certification
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