International Sign Association UK

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Guidance note 2022.02.15: Specifying Permanent Road Traffic Signs

including reference to UKCA marking

The main standard for permanent traffic signs is BS EN 12899-1:2007. This contains many different performance classes, so it is not sufficient to simply ask for a sign to be made to this standard, as you may receive one that meets only the lowest class. For example, class WL0 indicates that no wind resistance is required – a sign to this class could fail in a light breeze! You therefore need to specify the classes or values that you want.

Many of the classes have recommended values in the UK National Annex at the end of BS EN 12899- 1:2007, so most sign specifiers choose to adopt these. But there remain some characteristics for which the National Annex cannot recommend a single class or value, which must therefore be specified for your situation. These include the wind pressure and the required retroreflective performance.

You should always refer to the current "UK published" version of the standard for the requirements, including the UK National Annex. The standard was adopted under the UK designated standards list in December 2020. The published version is the adopted UK standard for the purposes of TSRGD.

Currently, the requirements for the UK can be found in BS EN 12899-1:2007, Incorporating corrigenda May 2008, June 2009, October 2011, May 2013, January 2018, May 2018 and August 2020. BS EN 12899- 1:2007 - Fixed, vertical road traffic signs. Fixed signs (bsigroup.com)

For signs on trunk roads (maintained by Highways England, Transport Scotland or Welsh Government or for Northern Ireland the Department for Infrastructure), you should note the requirements of any applicable National Highways Sector Scheme (NHSS) under the Manual of Contract Documents for Highways Works (MCHW) Manual of Contract Documents for Highway Works (MCHW) | Standards for Highways. Some local authorities also have this requirement for their own roads.

NHSS 9A relates to the manufacture of permanent road traffic signs. This element is now withdrawn and no further audits to 9A should be undertaken. Requirements for the manufacture of road traffic signs can be found in BS EN 12899. It is not a mandated requirement under MCHW and should no longer be included in tenders.

NHSS 9B relates to the installation on site of signs (excluding electrical works). This has now been developed and is a stand-alone element for those installers of non electrical elements.

The scheme was approved by the NHSS Liaison Committee in July 2021. There is no date yet determined for entry into the MCHW which is currently under review.

NHSS 9C covers the requirements for those retrofitting previously manufactured temporary road signs. The date fixed for the introduction of this element of the scheme is July 2021 but will be subject to a commencement date pending the training T30 becoming readily available through LANTRA. Lantra and the Sector 9 Committee will advise when this training is live.

NHSS8 covers the requirements for electrical installations. Those with Sector 8 approval for installation will be approved under 9B.

NHSS 6 covers the manufacture of minor structures, which includes posts and supports for traffic signs, so some authorities require those supplying sign structures or posts also to be certified to this scheme.

Any such device erected on a road is a traffic sign and is governed by section 64. Case law has established that any road to which the public has access, ***including roads in car parks, motorway services, airports (landside but not airside) etc.*** is a road for the purposes of RTRA.

BS EN 12899 applies to "Fixed, vertical road traffic signs", so does not apply to portable signs. Other standards, e.g. 12966, apply to variable message signs (VMS) and other types of traffic sign not within the scope of BS EN 12899.

Interestingly, the scope of 12899 says the main intended use of fixed signs is for the instruction and guidance of road users "on public and private land". This seems to go slightly wider than RTRA, and ***arguably makes UKCA marking applicable to all such signs even if erected on roads to which the public does not have access***. The original mandate term we suspect was intended to apply to all fixed traffic signs wherever they were located.

Scope of BS EN 12899 states intended use of the sign is for the instruction and guidance of road users "on public and private land". This implies demonstrating conformity by way of UKCA marking and is applicable to permanent traffic signs even if erected on roads to which the public does not have access. The following check list was drawn up with straight forward traffic signs in mind however, it would be prudent for sign makers and installers to consider this checklist very carefully.

If you are specifying to EN 12899-1 fixed signs
Issues to be considered by purchaser when more than one supplier is used for a sign assembly

- Signs ordered direct from sign manufacturer
- Posts from depot stock
- Luminaires direct from luminaire manufacture
- **Comment:** If you are purchasing signs, posts, light units etc. from different manufacturers/suppliers, the purchaser i.e. you are then responsible for the UKCA compliance of the finished assembly and as such the sign would need to be UKCA marked. Unfortunately, this is not as cut and dried as it seems as if the various items are being ordered from stock, each item can be individually UKCA marked and comply with the

standard but it is still the responsibility of the purchaser to ensure that when taken from stock the assembly is fit for purpose and hence has to CE mark the assembly

Product Manufacturers conformity requires:

- Sign face - requires post detail & wind loading
- Posts / supports - requires sign area etc.
- Luminaires & arms - Manufacturer declares conformity of unit for sign size and shape

If using sub-contractor, make sure they work to BS EN 12899!

Actions for sign manufacturer before placing product on the market
Below is a demonstration of UKCA marking that will need to be applied to the sign or supplied as accompanying documentation in order to conform with BS EN 12899-1 Fixed Signs.

The details on the label is only one example of the labelling which may be required as depending upon whether only the sign has been ordered or whether the whole assembly i.e. sign, posts, clips, illumination etc. have been ordered determines what information is required on the label. This details does not need to be on the reverse of the sign as they can be supplied as supporting documentation. In any event, the minimum labelling requirements for the sign are given in BS EN 12899 and should contain number & date of the European Standard, relevant performance class of the product i.e. RA1, RA/R2, R38-UK, the last two digits of the year of manufacture, name of the manufacturer and the batch/lot number.

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EN 12899-1:2007
Retroreflective sign plates with external illumination for fixed vertical road traffic signs
Resistance to horizontal loads -
Fixings – Pass
Wind action - WL2
Temporary deflection bending – TDB5
Dynamic snow load - DSL1
Point loads - PL2
Permanent deflection – Pass
Partial action factor – PAF1
Visibility characteristics
Daylight chromaticity & luminance factor–CR1
Coefficient of retroreflection – RA1
Mean illuminance – E3
Uniformity of illuminance – UE2
Durability
Impact resistance of sign face material - pass
Resistance to weathering (three year accelerated natural weathering test) - Pass
Resistance to corrosion – Aluminium; SP1
Resistance to penetration of dust and water – IP56

Where a sign is installed on an existing post, the sign can be UKCA marked but clearly the post cannot.

The Purchaser is responsible for post being structurally suitable. The Purchaser advises sign manufacturer of post details & wind loading for designs, sign substrate / channels to structurally conform. In the majority of cases, the Purchaser will be the sign company buying the sign. If the sign company is making the sign, they will have to comply with all the requirements themselves.

Those signs & devices that fall outside scope of EN 12899; 2007;

BS 8442 Miscellaneous road traffic signs & devices
This specifies requirements and tests for rigid and flexible portable signs, barriers, self-supporting portable signs, stop/go signs, school crossing patrol signs, flap signs, flat traffic delineators, pedestrian crossing and refuge beacons, internally illuminated posts, twin amber flashing light units, retro reflective self-righting bollards, and non-retro reflecting road studs.

BSGA Members William Smith **www.williamsmith.co.uk** are amongst those small number of road traffic sign suppliers who are already compliant with the current legislation. Anyone supplying signs that are not UKCA marked and compliant will in effect be breaking the law.

For further detail please contact BSI **www.bsigroup.com** for copies of BS EN 12899; 2007 or William Smith/ARTSM for further guidance.

Future Conformity Assessment marking requirements
From 1 January 2022 all permanent traffic signs will require a UK declaration of performance and a UKCA mark. UK Traffic signs remain covered by the EU Construction Product Regulations (CPR), which has been adopted by the UK under the Construction Products Regulations 2013 (SI 2013 No 1387). Different requirements apply to Northern Ireland. All ARTSM members are compliant to the current CE Marking requirements and are working towards the transfer to UKCA marking by this date.

Passive safety
If the sign is required to be on crash-friendly posts, you will also need classes from the standard BS EN 12767:2019. Steel and aluminium posts with a diameter of 89 mm or smaller are deemed to be passively safe to this standard, provided they are no stronger in bending than a S355 steel section of that diameter with a 3.2 mm wall thickness. You should also consider post centres under Annex K of the standard.

Checklist for specifying a traffic sign
The list below gives the minimum information needed and helps you to avoid missing anything essential. More detail should always be given when available and will help the supplier to deliver exactly what you want and expect. Guidance on any of the above is available from any ARTSM member and more detail is given in the sections below. Further information, including a site plan, will be needed by the contractor erecting the sign. If you have any other specific requirements, such as the need for documentation, calculations or

test certificates, this should be requested at the time of purchase, as these cannot easily be provided at a later date.

Checklist
As the designer/procurer have you included all the following in your order or specification?

1. The sign is to comply with BS EN 12899:2007 and its National Annex.
2. The sign must comply with Traffic Signs Regulations & General Directions (TSRGD)
3. From 1 January 2022, that the sign be UKCA marked.
4. For trunk roads, the sign installer must be certified to NHSS 9B or NHSS8.
5. The overall dimensions of the sign face.
6. Preferably a drawing of the sign face, either in colour or clearly labelled to indicate colours. For a standard sign from TSRGD the diagram number, together with any optional text or other permitted variation required may be sufficient. Do not forget to specify if the sign should be reversed.
7. The type of any electrical illumination needed.
8. The class of reflective performance of the sign face.
9. Any particular sign substrate to be used.
10. The number, type and length of posts required, whether they need to be passively safe, and their finish.
11. The mounting height of the sign and spacing of the posts (information needed to correctly stiffen the sign face even if the posts are to be provided by others).
12. The wind load class or pressure the sign needs to withstand.
13. Ensure that on installation the remove by date is affixed under Schedule 13 Part 7 TSRGD where required.

Sign Face Sheeting
Modern traffic signs are faced with a long-lasting plastic material that is usually retroreflective. Signs intended only for pedestrians or mounted parallel to the kerb line do not generally need to be reflective, as they are unlikely to be illuminated by vehicle headlamps. Retroreflectivity is achieved by a variety of technologies. However, it is the performance, not the underlying technology, that is important to the sign specifier, and this is recognised in the classes recommended in the UK National Annex to BS EN 12899-1:2007 (with Corrigenda as above). The Table below provides the recommended performance requirements for different locations.

- Locations where high-performance materials more suitable for overhead gantry signs are required Class R3C
- Locations where high-performance materials are required Class R3B
- Other locations where retroreflectivity is needed Class RA2 or Class R2
- Non-retroreflective material Class NR1 or R1

Classes R2, R3B and R3C refer to tables NA.1A, NA.1B and NA.1C in the UK Annex and relate to products that have a European Technical Approval (ETA) to one of these classes.

Class RA1 refers to the lowest grade of retroreflective material, sometimes known as Engineer Grade, which is not recommended for use on UK traffic signs.

You should specify the required reflective performance classes of the sign in accordance with BS EN 12899 as stated above.

The Public Procurement Contract Regulations 2015 Regulation 42 paragraph 12 states : 'technical specifications shall not refer to a specific make or source or a particular process which characterises the products or services provided by a specific economic operator, or to trade marks, patents, types or a specific origin or production with the effect of favouring or eliminating certain undertakings or certain products (excepting paragraph 13).'

Sign Substrates
The traffic signs standard gives the stiffness required of a traffic sign but, as a performance standard, says nothing about what material it should be made from. There are sometimes good reasons why you might want to choose a particular type of material for the sign substrate:

- To minimise the scrap value and therefore the likelihood of theft
- For reasons of economy, particularly for temporary signs
- To make the sign easier to handle and mount.

If you require a specific type of substrate you must ensure you state this requirement otherwise manufacturers will determine the type of substrate fit for purpose from the design requirements. It is key therefore that you provide as much information as possible. Unless you specify otherwise, a sign will usually be made of 2.5 mm (12 gauge) aluminium alloy, stiffened by aluminium channels affixed to the back. This provides excellent structural support, but you might also wish to consider:

Traffic grade composite sheet
Composite material has an LDPE (polyethylene) core between aluminium skins. It provides similar structural support to solid aluminium sheet, but is lighter in weight, less susceptible to theft and less affected by price fluctuations. Traffic grade composite sheets differ from other composites by having a saline-resistant bonding agent that resists road salt.

Glass Reinforced Plastic (GRP)
GRP is a light weight substrate that is often used in areas prone to theft, and particularly for temporary signs. GRP sheet does not offer the same structural support as other materials, so requires more supporting channels, and is generally limited to small and medium-sized signs

1.2mm steel sheet
Also used in areas prone to theft, the steel sheet has corrosion resistant coatings. It may need more supporting channels than solid aluminium. It is the heaviest substrate, so is generally only used for regulatory and warning signs. Again, you should note the requirements under the Public Contracts Regulations 2015 for sign substrates. Suppliers should be free to use any compliant material from any approved source. The back of a sign will generally be grey, but TSRGD (Direction 9) also allows you to specify black. If you are specifying a sign to be erected by someone other than its manufacturer, you might want to stipulate that a large sign should be made in modules, for ease of handling and erection.

Wind Loading

The wind load on a sign varies throughout the country and depends also upon altitude, proximity to the coast, and the overall height of a sign. Signs can be made more economically and mounted on more slender supports and using smaller foundations if the local wind load is specified. It is therefore important to provide an individual wind load for each sign whenever possible. Smaller authorities may wish to derive a wind pressure or class that is applicable to any road in their area. Without this information, a sign manufacturer might assume that no wind load resistance is required.

BS EN 12899 has wind load classes WL0 to WL9, but recommended UK practice is to specify a basic wind pressure (W_b) in N/m^2 (which may also be written as $N\ m^{-2}$ or Pa).

Whilst being essential for the design of supports and foundations, the wind load should also be provided when only the sign face is being procured. Together with the support positions, this allows the number and type of stiffening channels to be correctly designed.
The essential requirements for the structural design of a sign are:

- Sign face width and height
- Mounting height
- Number of posts
- Post positions (distance between posts and overhang)
- Basic wind pressure

If all this information is not supplied when a sign face alone is being procured, ARTSM members will make the assumptions given in the box below. This may lead to the sign being more costly than necessary, or to it being insufficiently stiffened for the actual situation.

ARTSM Assumptions for verge mounted signage
This does not cover gantry signs

For use when a sign face alone is procured (without supports), and insufficient information is provided on its intended location or mounting.

- Basic wind load : 1200 N/m^2 (BS EN 12899:2007 class WL6 in England & Wales)
- Signs up to 1.5m width are mounted on a single central post
- Signs 1.6m to 4m wide are mounted on two conventionally positioned posts
- Signs 4.1m to 6m wide are mounted on three conventionally positioned equally spaced posts
- Signs are mounted at a height of 2.1m

For a sign over 6m wide or over $12m^2$ area no assumptions will be made and the manufacturer will refer back to you for the full information needed.

When these assumptions are used, the manufacturer cannot be held responsible for the performance of a sign mounted differently or at a particularly windy location.

Other Guidance documents are available on the ARTSM website free to download www.artsm.org.uk

Guidance from other organisations

Department for Transport guidance

- Traffic Signs Manual Chapter 1: assets.dft.gov.uk/publications/traffic-signs-manual/traffic-signs-manual-chapter-01.pdf

Sign Supports and Passive Safety

- Institute of Highway Engineers Sign Structures Guide
- Passive Safety UK Guidelines: www.ukroads.org/webfiles/Guidelines Print ready.pdf
- Sign Structures Guide 2021 – www.theihe.org/news-info/ihe-publications.

ISA-UK acknowledge the assistance of ARTSM (Association for Road Traffic Safety and Management) in the compilation of this guidance document.

ISA-UK Members are kept informed of the legislation and other requirements necessary to help keep them and their clients from falling fall foul of their obligations.