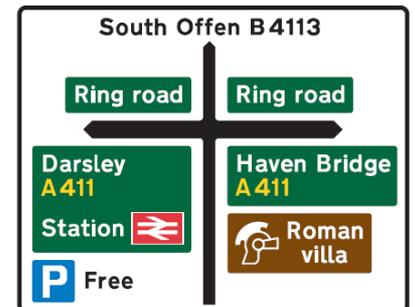


# SPECIFYING PERMANENT TRAFFIC SIGNS



## Introduction

ARTSM is the trade body for companies that manufacture and supply traffic signs in the UK. Its members are committed to following all the relevant national and European standards, and have prepared this guidance for those purchasing traffic signs to help you through the complexity and to ensure you get the product you need that will perform well for its intended life.

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 WLO 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. Fortunately, 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.

For signs on trunk roads (maintained by Highways Agency, Transport Scotland or Welsh Government), the manufacturer must be certified to the relevant National Highways Sector Scheme (NHSS). Some local authorities also have this requirement for their own roads. NHSS 9A relates to the manufacture of permanent or temporary road traffic signs and NHSS 9B to their installation on site. 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.

## Future CE marking requirements

From 1 July 2013 all permanent traffic signs will require a declaration of performance and a CE mark. After that date it will be unlawful to supply a product to BS EN 12899-1 without this. Traffic signs are covered by the Construction Product Regulations (CPR), being implemented in over 30 European countries.

All ARTSM members are working towards this goal and their products will be totally compliant 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 12767:2007, or you may wish to specify a particular product for uniformity with other signs in the area. Steel or aluminium posts of 90 mm diameter / 3.2 mm wall thickness or smaller are considered to be passively safe to this standard.

## Checklist for specifying a traffic sign

This 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.

### Checklist

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. From 1 July 2013, that the sign be CE marked.
3. For trunk roads, the sign manufacturer must be certified to NHSS 9A.
4. The overall dimensions of the sign face.
5. 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, for example, or the wording changed from that illustrated in TSRGD.
6. The type of any electrical illumination needed.
7. The class of sign face material (indicating what grade of retroreflectivity is required).
8. Any particular sign face substrate to be used.
9. The number, type and length of posts required, whether they need to be passively safe, and their finish.
10. 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).
11. The wind load class or pressure the sign needs to withstand.

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.

## 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 either by incorporating glass beads into the material, or by moulding tiny prisms into the plastic, and are therefore known as glass bead or microprismatic sheetings. But 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 Corrigendum 31.10.11):

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

Classes R2 and R3B refer to tables NA.1A and NA.1B 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 must not specify a particular technology type or trade name for the reflective sheeting, and should simply refer to the classes above. Where two alternative classes are given, you should generally specify them both, leaving the manufacturer to decide which to conform to.

## 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.

Unless you specify otherwise, a sign will usually be made of 3 mm (11 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.

You should avoid using manufacturers' brand names for sign substrates, as 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 42) 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 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<sup>2</sup> (BS EN 12899:2007 class WL6)
- 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

For a sign over 6m wide or over 12m<sup>2</sup> 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.**

## Guidance documents available from [www.artsm.org.uk](http://www.artsm.org.uk)

- **Specifying Permanent Traffic Signs**
- **Specifying External Lighting Units**

For further information, please contact [enquiries@artsm.org.uk](mailto:enquiries@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](http://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:  
[theihe.org/knowledge-network/uploads/StructuresGuide2010.pdf](http://theihe.org/knowledge-network/uploads/StructuresGuide2010.pdf)
- Passive Safety UK Guidelines: [www.ukroads.org/webfiles/Guidelines Print ready.pdf](http://www.ukroads.org/webfiles/Guidelines%20Print%20ready.pdf)

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