Traffic Open Products and Specifications

TOPAS 2516D

Performance Specification for Discontinuous Variable Message Signs

Revision	Date	Scope	Authorised by
D	15/7/21	Final	Board

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TOPAS 2516D

PERFORMANCE SPECIFICATION FOR DISCONTINUOUS VARIABLE MESSAGE SIGNS

CONTENTS

CHANGE LOG

The following outlines significant changes to this specification, from its previous issue which do not impact on currently Registered products:

a. The revisions made in this specification ensure the performance classes in the specification align with BS EN 12966:2014+A1:2018 - Road vertical signs - Variable message traffic signs incorporating corrigenda June 2018 and April 2021;

b. References to TAL 01/05 and the tables therein are removed and substituted with additional Tables

c. The exclusion of vehicle activated sign systems under this specification which should be registered under TOPAS 2541 (Clause 1.9)

d. The exclusion of vehicle mounted light arrows under this specification (Clause 1.10)

The requirements for re-registration of existing products are defined in section 1.8.

1 INTRODUCTION

1.1 This specification covers the performance requirements for the control of Discontinuous Variable Message Signs that are intended for use on UK public highways.

1.2 TOPAS specifications are explicitly purchasing specifications and compliance with them is not mandatory. However Local and other Purchasing Authorities may typically require that equipment purchased complies with TOPAS specifications and is TOPAS registered.

1.3 Manufacturers may register products as being compliant with this specification, using the process defined in TOPAS 0600

1.4 TOPAS registration requires manufacturers submit a Technical File to an appropriate Technical Assessor to aid compliance verification. The content requirement for the Technical File is defined in Appendix Z of this specification.

1.5 Guidance to potential users of this Product is given in Appendix A.

1.6 Within this specification, "The Product" shall mean all components necessary to provide a complete operational unit meeting the requirements of this specification and the common requirements defined in TOPAS0600.

Implementation

1.7 This specification will be immediately implemented from the date of issue for all new TOPAS registrations.

1.8 For products previously registered against TOPAS 2516C, manufacturers are simply required to confirm in writing using the appropriate TOPAS form that the Products remain compliant with this amended specification. Once confirmed Product Registration information will be migrated on the TOPAS website.

1.9 For VAS products manufacturers should register to TOPAS 2541

1.10 There is no re-registration for vehicle mounted light arrows requiring DfT Authorisation covered under BS EN 12352. These products are no longer included within this specification.

Authorisation

1.11 In England, any legend or symbol intended to be displayed on a signal or sign face shall be either prescribed by the TSRGD or shall have received separate authorisation from the Department for Transport (DfT). In Scotland and Wales the devolved Assemblies provide a similar role. In Northern Ireland the Department for Regional Development undertakes this role.

Glossary of Terms

1.12 TOPAS Terms are defined in TOPAS 0600 and TOPAS 0601.

2 NATIONAL REQUIREMENTS

2.1 Equipment conforming to this specification shall comply with those classes of BS EN 12966 as invoked in the following regulations.

2.2 In Great Britain the Traffic Signs Regulations and General Directions 2016 (TSRGD). Schedule 16 Part 7 Tables 1, 2, 3 & 4 set out the classes for visual and physical performance and are repeated in this specification.

2.3 In Northern Ireland, requirements will be as contained in Traffic Signs Regulations (Northern Ireland) 1997 (as amended) (TSRNI). However, where a specific requirement is not contained in the Northern Ireland regulations [or TSRNI] or, through time has been superseded, reference should be made to the relevant specific requirements contained in the TSRGD 2016 (as amended).

2.4 The attention of purchasers and manufacturers is drawn to the publications that inform how and what signs and signals can be deployed on UK public highways, namely:

TSRGD 2016 (as amended).

TSR (NI)1997 (as amended).

2.5 The scope of BS EN 12966:2014 states that mobile, temporary and permanently installed VMS used on public and private land, including tunnels for the information, guidance, warning and/or direction of traffic are covered. For the avoidance of doubt, this means that mobile and temporary VMS should have the same visual and physical characteristics as the permanent VMS.

2.6 The way messages must be displayed on mobile and temporary VMS is prescribed in TSRGD 2016.

Conspicuity Devices

2.7 It is not precluded to use yellow flashing conspicuity devices with signs displaying regulatory and safety messages. Sizes, positions, flashing rates, duty cycles and synchronisation shall be as specified in TSRGD 2016 (as amended).

2.8 Dimensions and positioning of conspicuity devices are specified in TSRGD 2016 (as amended).

2.9 Any deviation in size or placement of conspicuity devices requires Authorisation by the Department for Transport.

2.10 The optical performance of conspicuity devices shall conform to BS EN 12966 as invoked in TSRGD 2016 (as amended).

3 PERFORMANCE CLASSES

The performance levels and classes stated below have been copied from the National Annex (NA) to BS EN 12966:2014 +A1:2018 (incorporating corrigenda June 2018 and April 2021) as defined in TSRGD 2016 (amended) which takes precedence over this document.

NA.2 - Visual Performance Levels

Table NA.1 – Approach speed and visual performance

85 percentile approach speed (mph)	Visual performance levels
Up to and including 50	1 or 2
Over 50	1

Table NA.2 – Class Designations

Visual performance parameter	**Class Designation**	
	Level 1	**Level 2**
Colour	C2	C2
Luminance	L3	L1
Luminance Ratio	R3	R1
Beam Width	B1 or B3	B1 or B3

SOURCE: *The Traffic Signs Regulations and General Directions 2016, Schedule 16: Variable Message Signs, Part 7, Table 3.*

NA.3 – Physical Performance Levels

Table NA.3 – Physical Performance

External conditions	**Class designation**
Temperature	T1
Ingress protection against water and dust	IP56

SOURCE: *BS EN 12966:2014+A1:2018, Table 12.*

Temporary deflections caused by wind load, temporary deflections caused by bending and temporary deflections caused by dynamic snow loads should all be in accordance with the national annex to BS EN 12899-1:2007, *Fixed, vertical road traffic signs – Part 1: Fixed signs*.

In addition, resistance of electrical components to the effects of pollution should be in accordance with pollution degree 2 as described in BS EN IEC 60664-1, *Insulation coordination for equipment within low voltage supply systems –Part 1: Principles, requirements and tests*.

NA.4 – Sign Selection

Annex N of the standard provides the designer or purchaser with guidance on the selection of the appropriate character size of text on VMS depending on its intended application. The two basic factors to be considered are:

- the legibility distance, depending on the size and design of the message and its visual performance (luminance, luminance ratio, beam width and colour); and
- the recognition time (the duration of legibility), depending on approach speed.

The calculated recognition time should not exceed the maximum recommended reading time for the purposes of this calculation, as detailed in Table NA.4. The process of calculating the recognition time is fully detailed in Annex N of the standard.

Table NA.4 — Maximum recommended reading time

Number of words in message	Maximum recommended reading time, s
1-3	3.0
4	3.3
5	3.6
6	4.0
7	4.3
8	4.6

Consideration should be given to the variable nature of sign displays. The maximum reading time should be taken for the highest number of words the sign is expected to display. Calculating the recognition time for the sign against the maximum recommended reading time, together with the speed of the road and beam width of the display, will confirm the character height.

Characters should be upper case with height based on a calculation of 7 × 5 (seven elements vertically and five elements horizontally) or a proportional alternative, for example 14 x 10. More information on character height, character width, character spacing, word spacing, line spacing and backing board dimensions can be found in Annex N of the standard

4 REFERENCES

General

4.1 Where undated references are listed, the latest issue of the publication applies.

British Standards

4.2 The British Standards Institution, London, publishes British Standards.

BS 7671	Requirements for Electrical Installations
BS EN 12368	Traffic Control Equipment – Signal Heads
BS EN 12767	Passive safety of support structures for road equipment - Requirements and test methods
BS EN 12899	Fixed Vertical Traffic Signs
BS EN 12966	Road Vertical Sign - Variable Message – Traffic Signs
BS EN 50293	Electromagnetic Compatibility Road Traffic Signal Systems Product Standard
BS EN 50556	Road traffic signal systems
BS EN 62262	Degrees of protection provided by enclosures for electrical equipment against mechanical impacts (IK code)
BS EN 60068	Environmental testing
BS EN 60529	Degrees of protection provided by enclosures (IP Code)
BS EN 60950	Information Technology Equipment

Specifications

4.3 TOPAS Limited publications are available from www.topasgroup.org.uk

TOPAS 0600	Self-Certification and Approval of Equipment for the Control of Vehicular and Pedestrian Traffic on Roads

Other Publications

4.4 Other publications can be obtained from the Stationary Office publishing.service.gov.uk

	Electromagnetic Compatibility Regulations 2016: Great Britain
	Electromagnetic Compatibility Regulations 2016: Northern Ireland
TSRGD	The Traffic Signs Regulations and General Directions
	Traffic Signs Manual, all Chapters

APPENDIX A INFORMATIVE GUIDE

General

A1 This appendix is an informative guide to highway authorities who wish to purchase and use discontinuous variable message sign that has been declared compliant to this specification. Prospective purchasers should ensure that the contract specification provides details of the following:

(a) The supply requirements if these differ from the standard mains supply;

(b) The type of faults which are to be reported by the fault monitoring facility, e.g. heater faults, pixel, module failures etc.

(c) Whether flashing amber conspicuity devices are required, if these are to be synchronised with other equipment, and if higher than normal flashing rates are necessary, their size, placement and if required, Departmental Authorisation;

(d) The cable infrastructure requirements;

(e) The control system interface requirements;

(f) Details of any built-in legends and pictograms that are required;

Note: The purchaser should note the importance of ensuring legends and pictograms to be used are authorised before manufacture commences where these are not already prescribed by TSRGD.

APPENDIX Z TECHNICAL FILE CONTENT

This appendix defines the necessary content for a Technical File Pack (a collection of relevant documents) which must be reviewed by an appropriate Technical Assessor as part of the TOPAS Registration process (See TOPAS 0600)

Only the 'ticked' items are required to be present in a Technical File Pack used to support TOPAS Registration against TOPAS 2516D.

Ref	Item	Description	Required
1	Technical File overview document.	A summary document outlining the product, specifying which TOPAS and other relevant specification(s) the product has been designed to comply with, together with a detailed table of contents for the Technical File Pack. Where copies of external certificates or documents are referred to these may be included within the Technical File overview document or supplied separately as part of the Technical File Pack.	✓
2	QA accreditation certificate(s).	A copy of the Quality Management Registration Certificates for the organisation applying for TOPAS Product Registration.	✓
3	Details of all CE CA markings that apply to the product.	A list of all directives complied with and how achieved. Typically this would be references to explicit CE/CA Technical Files and certificates, copies of which would be included in the Technical File Pack.	✓
4	A functional design description of the product.	A reference to the overall System Design Documentation for the product (by document part number and issue).	✓
5	Product part numbers	A list of top level assembly part numbers and their issue states including all firmware / software part numbers and issues.	✓
6	Statement of compliance	A clause by clause statement of compliance against TOPAS 2516D confirming compliance and/or listing caveats or deviations.	✓
7	Test procedures and results	A reference to all test schedules and test result documents (by	✓

		document part number and issue).	
8	EMC test results	A reference to EMC test performance requirements. Copies of the results of EMC testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack.	✓
9	Optical test results	A reference to Optical tests performance requirements. Copies of the results of Optical testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack.	✓
10	Environmental test results	A reference to Environmental tests performance requirements. Copies of the results of the Environmental testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack.	✓
11	Radio Test results (OFCOM IR 2030)	Copies of the results of Radio testing undertaken by an appropriately qualified independent approved test house must be included in the Technical File Pack. Reports should be those listed on the Declaration of Conformity & the Technical File or specific IR 2030 requirement.	N/A
12	Primary Safety Test results	For Traffic Control equipment specifically a reference to the Primary Safety Test schedule and test results by part number and issue. A copy of the test results should be included as part of the Technical File Pack.	N/A
13	Failure Mode Analysis	A reference to the product failure mode analysis requirements and results by document part number and issue.	N/A