A Guide to IS EN 1436 European Standard for Road Markings

IS EN 1436 - Road Marking performance for road-users replaced BS 3262. IS EN 1436 is an end performance specification concentrating on the needs of the driver. The standard specifies the various levels of performance that are approved for use in a contract specification, which will govern the required quality of the road marking. It also describes the methods of measuring the various performance characteristics. This is the one fundamental difference between the new IS EN standards and the superseded BS 3262, where there was just one level of quality specified for all road situations. With the new IS EN standards there are a number of levels of quality specified for several road marking characteristics.

The standard specifies the performance for the road user of white and yellow road markings based on luminance (colour), day-time visibility, night-time visibility and skid resistance combined with durability. The new specification also introduces the importance of wet-night visibility road markings. IS EN 1436 allows the Client to specify the performance needs of their road markings.

The road marking characteristics are as follows;

1. **R_L - Retroreflection** under vehicle headlamp illumination
   - Classes for dry road markings, 6 classes of performance
   - Classes for road markings in conditions of wetness, 5 classes of performance

2. **Colour**
   - **B** - Luminance, 6 classes of performance
   - Chromaticity, co-ordinates to fall within a defined square on the chromaticity diagram

3. **Skid Resistance**
   - **SRT** - Classes of skid resistance, 6 classes of performance
   - Class S_3 is generally specified for hatching and chevron areas

4. **Q_d - Reflection** in daylight or under road lighting, 3 classes of performance

When using the new IS EN 1436, it is possible to over specify, for example it is difficult to obtain high retro-reflectivity and skid resistance together, as a gain in one property is often achieved at the expense of the other. The more drop-on glass beads applied the greater the retro-reflectivity and the lower the skid resistance. Classes of high performance cannot always be achieved simultaneously.

The tables in the specification allow the Client to choose the performance required from road markings, leaving the onus on the contractor to produce a marking to meet their needs. The shaded areas in the table indicate the typical performance classes specified for road markings used in Ireland.

Table 1 Specifying Criteria for <u>White</u> Road Markings - IS EN 1436

Retro-reflection (dry)		Retro-reflection (wet)		Luminance		Skid Resistance	
Class	**R_L Value**	**Class**	**R_W Value**	**Class**	**ß Value**	**Class**	**SRT Value**
R_0	NIL	R_{W0}	NIL	B_0	NIL	S_0	NIL
R_2	**≥ 100 mcd**	R_{W1}	≥ 25 mcd	B_2	≥ 0.3	S_1	≥ 45
R_3	≥ 150 mcd	R_{W2}	≥ 35 mcd	**B_3**	**≥ 0.4**	**S_2**	**≥ 50**
R_4	**≥ 200 mcd**	R_{W3}	≥ 50 mcd	**B_4**	**≥ 0.5**	**S_3**	**≥ 55**
R_5	≥ 300 mcd	R_{W4}	≥ 75 mcd	B_5	≥ 0.6	S_4	≥ 60
						S_5	≥ 65

Table 2 Specifying Criteria for Yellow Road Markings - IS EN 1436

Retro-reflection (dry)		Retro-reflection (wet)		Luminance		Skid Resistance	
Class	**RL Value**	**Class**	**RW Value**	**Class**	**ß Value**	**Class**	**SRT Value**
R_0	NIL	R_{W0}	NIL	B_0	NIL	S_0	NIL
R_1	**≥ 80 mcd**	R_{W1}	≥ 25 mcd	B_1	≥ 0.2	S_1	≥ 45
R_3	≥ 150 mcd	R_{W2}	≥ 35 mcd	**B_2**	**≥ 0.3**	**S_2**	**≥ 50**
R_4	**≥ 200 mcd**	R_{W3}	≥ 50 mcd	B_3	≥ 0.4	**S_3**	**≥ 55**
						S_4	≥ 60
						S_5	≥ 65

Table 3 Specifying Criteria for Reflection in daylight or under road lighting Q_d - IS EN 1436

White		Yellow	
Class	**Q_d Value**	**Class**	**Q_d Value**
Q_0	NIL	Q_0	NIL
Q_1	≥ 80	Q_1	≥ 80
Q_2	≥ 100	Q_2	≥ 100
Q_3	≥ 130	Q_3	≥ 130
Q_4	≥ 160	Q_4	≥ 160

Related European Standards (EN) include the following

- IS EN 1436 Road Marking materials - Performance for road users
- IS EN 1423 Road Marking materials - Drop on materials - Glass beads, anti-skid aggregates and mixtures of the two
- IS EN 1424 Road Marking materials - Premix glass beads
- IS EN 1871 Road Marking materials - Physical properties
- IS EN 1790 Road Marking materials - Pre-formed Road Markings
- IS EN 1824 Road Marking materials - Road trials

Definitions

Functional Life & Durability

This refers to the retention of the integrity of the material in the marking. Functional life of a road marking is defined as the period during which the road marking fulfils all the requirements initially specified. The functional life of a marking should be defined in the contract.

Retro-reflectivity

Retro-reflectivity is the ability of a road marking to reflect light from a vehicle's headlights back to the driving position of a vehicle. Initially it will be determined by the amount of glass beads spread on the line. The continuing performance of the line is determined by the amount and quality of glass beads included in the body of the road marking. Retro-reflectivity is measured using a piece of equipment known as a Reflectometer.

For reflection in daylight or under road lighting the luminance coefficient in diffuse illumination Q_d is used and is expressed in $mcd/m^2/lux$.

Luminance

Luminance is the property of the marking which describes the brightness of its colour. Luminance poses difficulties of compliance where the Texture Depth of the road surface is above 2mm. Where the surface is very coarse; eg. newly surface dressed roads with a texture depth of 4.5 mm it may prove extremely difficulty to achieve a luminance value, hence Class B_0 may have to be specified.

Chromaticity

Chromaticity is the definition of the colour of the line by reference to the CIE chromaticity diagram.

Skid Resistance

Skid resistance measurement on road markings is carried out using the standard British pendulum apparatus. The units of measurement quoted in IS EN 1436 are followed by the abbreviation SRT. IS EN 1436 has a range of Skid Resistance Classes ranging from S_0 to S_5. The Skid Resistance Class specified for white and yellow road markings on public roads in Ireland should be Class S_2 SRT $\geq$ 50. For items such as transverse yellow bar markings at roundabouts, hatching and chevron areas, a higher Class of skid resistance should be specified.