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ETCS marker board definition

VERSIONS & MODIFICATIONS

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0A	22-02-06	initial version	RD
0B	02-05-06	Reference to EN 12899-1 added. Comments Dominique Ligier added.	RD
0C	16-05-06	Small editorial changes	RD
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1A	07-01-10	Colours and reflectivity included in general chapter. Editorial improvements.	RD
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2-	14-12-10	Release version (content unchanged)	RD

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2 Introduction

2.1 Purpose of this document

2.1.1.1 This document defines the ETCS marker boards which shall be used in conjunction with ETCS/ERTMS.

2.2 References

2.2.1.1 The following references are used in this document:

- [1] TSI Operations and traffic management annex A: "ETCS and GSMR rules and principles"
- [2] EN 12899-1:2007 (E) Fixed traffic signs

3 ETCS marker board definitions

3.1 ETCS Stop Marker

3.1.1 Dimensions

- 3.1.1.1 The dimensions of the ETCS Stop Marker shall be as outlined in Figure 1.
- 3.1.1.2 The dimensions in figure 1 shall be used only as relative dimensions. The absolute size of the ETCS Stop Marker is not harmonised.
- 3.1.1.3 For practical manufacturing purposes the actual relative dimension may deviate slightly from the relative dimensions given in Figure 1. This tolerance shall not exceed 5%.

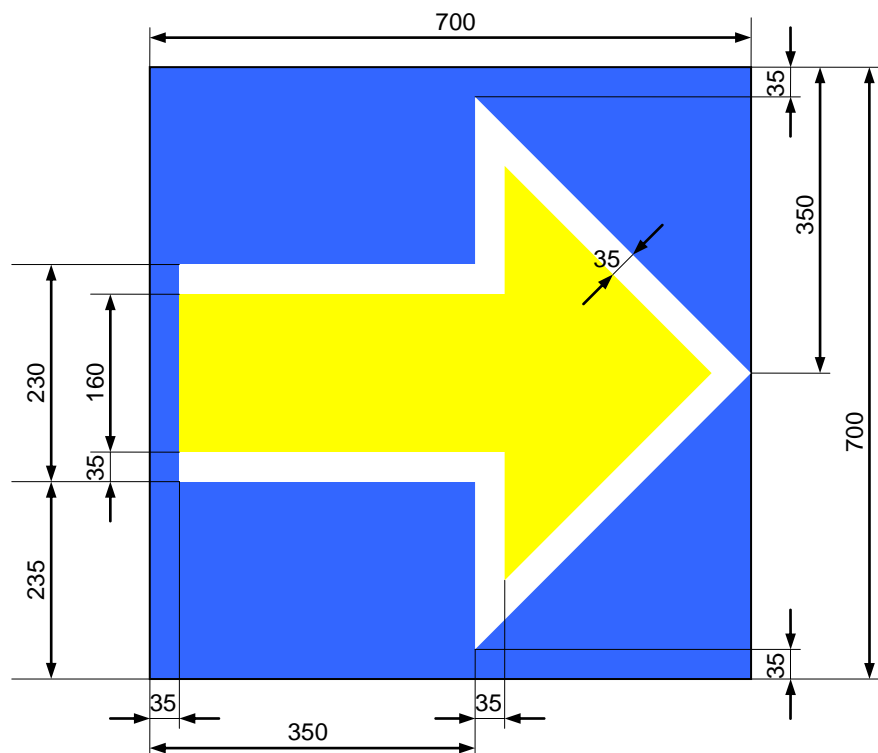


Figure 1 ETCS Stop Marker (left side)

- 3.1.1.4 The colours blue, white and yellow shall be used for the ETCS Stop Marker as outlined in Figure 1.
- 3.1.2 **Track reference**
- 3.1.2.1 The ETCS Stop Marker shall refer to the track to which it belongs as indicated in Figure 2.

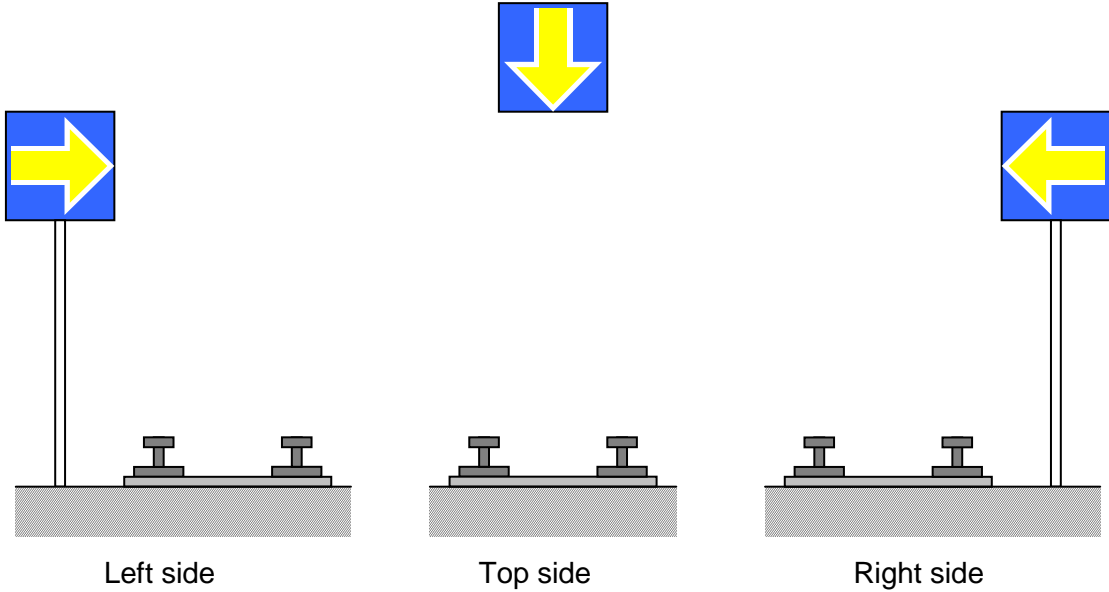


Figure 2 Reference of ETCS Stop Marker to track

4 General requirements

4.1 Operational use

- 4.1.1.1 The operational use of the ETCS marker boards is defined in [1].
- 4.1.1.2 In order to enable the driver to refer to a specific marker board each ETCS marker board shall be provided with a clearly visible and unambiguous identification.

4.2 Colours

- 4.2.1.1 The colours of the ETCS marker boards shall be implemented according to Table 1.

Colour	1		2		3		4		Luminance factor β
	x	y	x	y	x	y	x	y	
White	0,305	0,315	0,335	0,345	0,325	0,355	0,295	0,325	$\geq 0,27$
Yellow	0,494	0,505	0,470	0,480	0,513	0,437	0,545	0,454	$\geq 0,16$
Red	0,735	0,265	0,700	0,250	0,610	0,340	0,660	0,340	$\geq 0,03$
Blue	0,130	0,090	0,160	0,090	0,160	0,140	0,130	0,140	$\geq 0,01$
Green	0,110	0,415	0,170	0,415	0,170	0,500	0,110	0,500	$\geq 0,03$
Dark green	0,190	0,580	0,190	0,520	0,230	0,580	0,230	0,520	$0,01 \leq \beta \leq 0,07$
Brown	0,455	0,397	0,523	0,429	0,479	0,373	0,558	0,394	$0,03 \leq \beta \leq 0,09$
Grey	0,305	0,315	0,335	0,345	0,325	0,355	0,295	0,325	$0,12 \leq \beta \leq 0,18$

Table 1 Colour and luminance factors

- 4.2.1.1.1 Note: Table 1 is consistent with the daylight chromaticity and luminance factors class CR2 and with the coefficient of retroreflection class RA2, both as defined in [2].

4.3 Reflectivity

- 4.3.1.1 The retroreflectivity of the ETCS marker boards shall be implemented according to Table 2.

Geometry of measurements		Colour								
α	β_1 ($\beta_2=0$)	White	Yellow	Red	Green	Dark green	Blue	Brown	Orange	Grey
12'	+5°	250	170	45	45	20	20	12	100	125
	+30°	150	100	25	25	15	11	8,5	60	75
	+40°	110	70	15	12	6	8	5	29	55
20'	+5°	180	120	25	21	14	14	8	65	90
	+30°	100	70	14	12	11	8	5	40	50
	+40°	95	60	13	11	5	7	3	20	47
2°	+5°	5	3	1	0,5	0,5	0,2	0,2	1,5	2,5
	+30°	2,5	1,5	0,4	0,3	0,3	#	#	1	1,2
	+40°	1,5	1	0,3	0,2	0,2	#	#	#	0,7

Indicates "Value greater than zero but not significant or applicable".

Table 2 Coefficient of retroreflection RA (cd/lx/m²)

4.3.1.1.1 Note: Table 2 is consistent with the coefficient of retroreflection class RA2 as defined in [2].