

1. The Czech Republic National Annex (NA) to the EN 12899-1: 2007

(excerpt from ČSN EN 12899-1: 2008)

NA.2.3 To the item 4.1.1.3 Daylight chromaticity and luminance factor

Traffic signs must comply with the CR2 class.

Tables 1 and 2 are completed with values stated in the table NA.1.

Table NA.1 – Daylight chromaticity and luminance factor, class CR 1 and CR 2

Colour	1		2		3		4		Luminance Factor β
	x	y	x	y	x	y	x	y	
ruby	0,735	0,265	0,674	0,236	0,569	0,341	0,608	0,345	$\geq 0,03$
Ylw/grn fluo	0,387	0,610	0,460	0,540	0,438	0,508	0,376	0,568	$\geq 0,60$
Org fluo	0,595	0,351	0,645	0,355	0,570	0,429	0,531	0,414	$\geq 0,25$

Fluorescent luminance factor for ylw/grn fluorescent sheeting must be min 0,35, for orange fluorescent sheeting min 0,18 respectively. This value is guaranteed by the sheeting manufacturer.

NA.2.4 To the item 4.1.1.4 Coefficient of retroreflection R_A

The usage of RA 1, RA 2 and RA 3 (R'3) classes on different roads is described in the Ministry of Transport by-law (TP 65:2013, Table 3: Minimum characteristics of permanent vertical traffic signs for various roads categories and classes).

The similar requirements as for printed colours are valid even for transparent coloured sheeting.

The coefficient of retroreflection requirements for ruby are the same as for red.

NA.2.6 To the item 4.2 Microprismatic material

Microprismatic materials are preferably used on traffic signs, optical effectiveness of which is needed for the distance 100m and more (motorways, highways, esp. on gantries), and/or for averse illumination/entrance angles

Requirements for the daylight chromaticity and luminance factor for microprismatic retroreflective materials (class RA 3) are identical to those for RA 2.

The coefficient of retroreflection for the microprismatic retroreflective materials minimum values are stated in the table NA.2.

Table NA.2 – Coefficient of retroreflection for the RA 3 class, $\text{cd}\cdot\text{lx}^{-1}\cdot\text{m}^{-2}$

Geometry of measurements		Colour							
α	β_1 ($\beta_2 = 0$)	White	Yellow	Red	Green	Blue	Orange	Ylw/grn fluorescent	Org fluorescent
20°	+5°	300	195	60	30	19	150	270	150
	+20°	240	155	48	24	16	120	215	
	+30°	165	110	33	17	11	83	140	90
	+40°	30	20	6	3	2	15	24	60

1°	+5°	35	23	7	3,5	2,5	18	70*	7,5
	+20°	30	20	6	3	2	15	60*	
	+30°	20	13	4	2	1,5	10	43*	2,5
	+40°	3,5	2	1	#	#	2	9*	2,5
1° 30'	+5°	15	10	3	1,5	1	7,5	17*	
	+20°	13	8	2,5	1	#	6,5	14*	
	+30°	9	6	2	#	#	4,5	8,6*	
	+40°	1,5	1	#	#	#	1	3,8*	

For the observation angle $\alpha = 20'$ and entrance angles $\beta_1 = 5^\circ$ and $\beta_2 = 0^\circ$, the ratio between the minimum and the maximum coefficient of Retro-reflection when rotating from $\varepsilon - 75^\circ$ to $+ 50^\circ$ in 25° steps, shall not be greater than 2.5:1.

indicates "Value greater than zero but not significant or applicable"

* Values are recommended

2. The Czech Republic Ministry of Transport's by-law (excerpt from the TP 65:2013).

Table 3: Minimum characteristics of permanent vertical traffic signs for various roads categories and classes

Road Type	Sign size			Coefficient of retroreflection		
	Smaller	Basic	Enlarged	RA1	RA2	RA3
<i>Motorway</i>						
<i>Road for Motor Vehicles</i>						
<i>Interurban road class I.</i>						
- sign on the road		o ¹	o			o ²
- parking sign		o		o ²		
- selected signs			o			o ²
- overhead sign			o			o ²
<i>Other roads class I.</i>						
- sign on the road		o			o ²	
- parking sign	o			o ²		
- selected signs		o			o ²	
- overhead sign		o			o ²	
<i>Road class II.</i>						
<i>Interurban road class II.</i>						
- sign on the road		o			o ²	
- parking sign	o			o ²		
- selected signs		o			o ²	
- overhead sign		o			o ²	
<i>Road class III.</i>						
<i>Interurban road class III.</i>						
<i>Private road</i>						
- sign on the road	o			o ²		
- parking sign	o			o ²		
- selected signs		o ²		o ²		
<i>Interurban road class IV.</i>	o			o ²		
<i>Road for cyclists</i>						

o requirement

¹ left-side sign installation possible

² interurban: usage of the transilluminated sign possible