

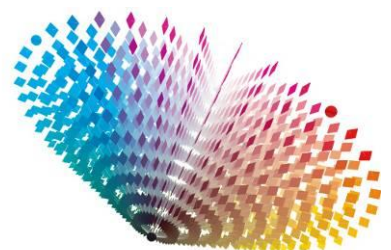
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# COLOUR DEFINITION REPORT

Thank you for choosing NCS Colour Services, annually we help hundreds of companies to manage their colours. We hope this Colour Definition Report will support you in your colour management process and look forward to assisting you again in the future.



## Colour to NCS Notation

This service includes instrumental measurement to determine the exact NCS value and visual assessment to determine the nearest standardised NCS colour.

### Report data

<b>Sample</b>	Name/Notation of the measured sample.
<b>NCS</b>	Exact NCS Notation determined by colour measurement.
<b>Nearest NCS</b>	The closest colour sample available in the SS 19102:2004 NCS Atlas determined by visual colour matching.
<b>X Y Z</b>	CIE tristimulus values with one decimal (Y=light reflectance factor) evaluated in CIE standard illuminant D65 and CIE 10 degree standard observer.
<b>s c <math>\phi</math></b>	Exact value of NCS blackness ( <i>s</i> ), chromaticness ( <i>c</i> ) and hue ( $\phi$ ) with one decimal.

SAMPLE	NCS	NEAREST NCS	X	Y	Z	s	c	$\phi$
Sample	7015-R93B	NCS S 7010-R90B	7.5	8.2	12.0	70.1	14.9	R92.6B

The Natural Colour System<sup>®©</sup> (NCS) makes it possible to describe unambiguously any colour in the sense of a colour percept, in other words a colour perceived visually, i.e. the colour which one sees. The measured NCS values describe the colour perception of surface colours in a specified viewing condition (SS 01 91 04). The system does not include colours that appear to belong to translucent or luminescent objects (so-called volume colours and luminous colours), nor does it include other visual properties of the surface layer, such as gloss and texture. An NCS Notation does not describe the physical or chemical properties of an object.

\*) Samples marked with an asterisk do not fulfil all of these conditions and the given NCS Notations can by this reason divide from the colour percept. Nearest NCS sample is based on visual assessment in accordance with SS 01 91 04 and may also deviate from the NCS Notation due to these conditions.

### Services and Solutions

If your measured colour should be communicated to other parties within your colour process we can assist you in duplicating the colour into colour standards with our NCS Precise Colour Sample service.

If you want to visually see the nearest standardised NCS colour please order a sample (A4, A6 or A9) of it on our [website](#).

If you want to use the nearest standardised NCS colour as a colour standard for high quality purposes order a NCS Calibrated Matching Standard on our website.

If you want to translate your nearest standardised NCS colour into CMYK or RGB and export it to your architecture or design software, please use [NCS Navigator Premium](#).

# Colour Difference

This service includes calculated colour difference(s) between a colour sample selected as standard (Standard) and your other colour sample(s), based on instrumental measurement.

## Report data

**Sample** Name/Notation of the measured sample.  
 $\Delta E_{CMC(l:c)}$  Calculated colour difference compared to the row marked "Standard".

SAMPLE	$\Delta E_{CMC(1:1)}$
7015-R90B	Standard
Sample	0.8

SAMPLE	$\Delta E_{CMC(2:1)}$
7015-R90B	Standard
Sample	0.7

For your target colour, NCS 7015-R90B, there are no tolerances set up. However, visually it looks good and a final production should neither be lower in chromaticness nor whiter or less reddish than your test sample.

The  $\Delta E$  value quantifies the difference between two colour samples.  $\Delta E_{CMC(1:1)}=0$  is a perfect match, i.e. no difference in colour between the measured samples. The limit of visually perceptible colour difference is approximately  $\Delta E_{CMC(1:1)}=0.3$  for a person with normal colour vision.  $\Delta E_{CMC(1:1)}=1$  is in many industries considered a commercially acceptable match. For the calculated  $\Delta E_{CMC(1:1)}$  value to correspond well with what one sees, samples with similar surfaces (texture and gloss) should be compared.

The  $\Delta E$  value is calculated between the CIELAB coordinates from different measurements with the aim that the scale should correlate with small visually perceived colour difference. Due to historical reasons, many different  $\Delta E$  formulas are in use by the industry. The newer formulas often correlate better than the older ones. The most used formula is the CIELAB  $\Delta E^*$ , this formula was first recommended in 1976. The formula commonly used and recommended for textile purposes is the  $\Delta E_{CMC(2:1)}$  formula, standardised in 1988 (British Standard, BS 6923:1988). In this report both  $\Delta E_{CMC(1:1)}$  and  $\Delta E_{CMC(2:1)}$  are given. For best performance of the formula, surfaces with the smallest possible differences in gloss and texture should be compared. Under these criteria, the limit for visually perceived colour difference is around 0.3  $\Delta E$ . For  $\Delta E_{CMC(1:1)}$  values larger than 5 units the correlation should not be trusted.

## Services and Solutions

NCS Colour's experts can help you in evaluating and defining colour tolerance area for your colour suitable in your specific industry, for your specific materials and production methods. They can also create visual tools for colour approval and/or Technical Colour Specifications for you to use when communicating your desired colour to internal and/or external parties.

For more information please contact us.

## Measurement Conditions for Colour Measurement

The colour measurement and analysis have been carefully made, checked and certified by NCS Quality Centre according to Swedish Standard, SS 01 91 04, in a spectrophotometer traceable to NCS reference instrument. The CIE measurement values in accordance with CIE publ. 15.2004 is based on the following specification:

- Measurement geometry:  $d_i:8^\circ$ , UV component included.
- CIE standard light source D65 and CIE 10 degree standard observer.
- Readings every 10 nm from 360 to 750 nm.
- NCS S 0500-N (white) is used as a sample backing for reflectance measurement.

## Other services

Storage and archiving is not included in NCS Colour Services, neither of colour standards nor measurement data. If you are interested in us saving your vital colour information and also make it available to you and your suppliers in a reliable way in the future, please contact us about our new concept, NCS Colour Core.

Normal colour vision and the ability to see small colour differences is a fundamental ability for personnel involved in colour control. Please contact us for more information on colour vision testing.

If you have any questions, please, do not hesitate to contact us.  
We are always glad to be of service.

Please note that NCS - Natural Colour System<sup>®</sup> is a registered trademark and may only be used commercially after a license agreement has been signed with NCS Colour AB.

We look forward to hearing from you again.

With best regards,

NCS COLOUR AB

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