

Input	Output	Input and output media and applications		Standard
		Input media	Output media Application	
-	-	-	Basis	DIN 33866-1
analog	analog	DIN-test chart (hardcopy)	Hardcopy Copier	DIN 33866-2
analog	digital	DIN-test chart (hardcopy)	File Scanner	DIN 33866-4
digital	analog	DIN-test chart (File)	Hardcopy Printer Softcopy Display	DIN 33866-3 DIN 33866-5

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Input	Output	Input and output media and applications		Standard or TR
		Input media	Output media Application	Technical Report
-	-	-	Basis	ISO/IEC TR 24705
analog	analog	ISO/IEC-test chart (hardcopy)	Hardcopy Copier	ISO/IEC 15775
analog	digital	ISO/IEC-test chart (hardcopy)	File Scanner	ISO/IEC TR 24705
digital	analog	ISO/IEC-test chart (File)	Hardcopy Printer Softcopy Display	ISO/IEC TR 24705 ISO/IEC TR 24705

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Input	Output	Input and output media and applications		Technical Report (TR) or Standard	Method & Test: Linearization
		Input media	Output media Application		
-	-	-	Basis	ISO/IEC TR 24705	DIN 33866-1 DIN 33872-1
analog	analog	ISO/IEC-file series equally spaced in rgb + ISO/IEC-test chart (hardcopy) series equally spaced in LCH^*	Hardcopy Copier	ISO/IEC 15775	DIN 33866-2 JIS X 6933
analog	digital	ISO/IEC-test chart (hardcopy) series equally spaced in LCH^*	File Scanner	ISO/IEC TR 24705	DIN 33866-4
digital	analog	ISO/IEC-test chart (File) series equally spaced in rgb	Hardcopy Printer Softcopy Display	ISO/IEC TR 24705 ISO/IEC TR 24705 ISO 9241-306:2008	DIN 33866-3 DIN 33872-2,4 DIN 33866-5 DIN 33872-2,4

The ISO/IEC-input linearisation method produces an ISO/IEC-file from an ISO/IEC-original scene: Flower motif with 16 equalisation grey steps, and 14 CIE-test colours according to CIE 13.3
The ISO/IEC-output linearisation method produces from an ISO/IEC-file a linearized display, offset or printer output:

ISO/IEC-input linearisation method			ISO/IEC-output linearisation method		
Input	Output	Application	Technical Report (TR) or Standard	Input	Output media Application
Original scene + CIE colours	ISO/IEC Image File	Reference Image File	ISO/IEC 15775 ISO/IEC TR 24705	ISO/IEC File	Hardcopy Printer
				ISO/IEC File	Softcopy Display
				ISO/IEC File	Softcopy Offset Hardcopy Printer

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TUB-test chart SE20; colour image reproduction
ISO/IEC Standards & Technical Reports

What is Output Linearization? (For the elementary hues, see CIE R1-47:2009.)
The colour space of a double cone includes 6 colours. The six colours can be the device-dependent device colours (index d): (R, Y, G, B, N, W_d) or the device-independent elementary colours (index e): (R, Y, G, B, N, W_e). Elementary red appears neither yellowish nor bluish. The hue angle is $h_{ab,e} = 26$.

For example for the sRGB colours according to IEC 61966-2-1 it is valid:
Device red R_d has the coordinates rgb^*R_d and $LCH^*R_d = (L^*, C^*_{ab}, h_{ab})R_d$
Elementary red R_e has the coordinates rgb^*R_e and $LCH^*R_e = (L^*, C^*_{ab}, h_{ab})R_e$
Corresponding data are given in the following for R_d, R_e , and $W = W_d = W_e$

$$rgb^*W = (1 \ 1 \ 1)_W$$

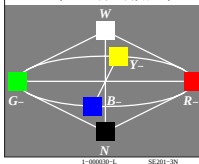
$$LCH^*W = (L^*, C^*_{ab}, h_{ab})W = (95, 0, -)_W$$

$$rgb^*R_d = (1 \ 0 \ 0)_{R_d}$$

$$LCH^*R_d = (50, 100, 40)_{R_d}$$

$$rgb^*R_e = (1 \ 0 \ 0)_{R_e}$$

$$LCH^*R_e = (50, 87, 26)_{R_e}$$



Output Linearization of CIE R1-09:2015 produces for the hue angle $h_{ab,R_e} = 26$ the CIELAB data $L^*_{R_e} = 50$ and $C^*_{ab,R_e} = 87$. These CIELAB data are produced with the device to elementary input data (de)
 $rgb_{de,R_e} = (1 \ 0 \ 0, 26)_{de,R_e}$
A calculated table for 360 hue angles includes:
 $h_{ab} \quad LCH^*_{de} \quad rgb_{de}$
26 50 87 26 1 0 0,26

Three device (d) coordinates rgb^*_d describe 8 device colours RGB_d, CMY_d , and NW .

Hexagon-triangle system based on device (d) colours: rgb^*_d with linear relations between $rgb^*_d - LCH^*_d$ (compare approximately linear relations between $rgb_{d,RGB}$ and L^*)
Equations $rgb^*_d - LCH^*_d$ in both directions have been published, see: Richter, CIE-Proceedings, Beijing, 2008, Volume 3 and DIN 33872-1
Three equations (tables) are needed for office applications:
 $rgb_d - LCH^*_d$ for a 9x9x9 grid of equally spaced rgb_d input data
 $rgb^*_d - LCH^*_d$ for a 9x9x9 grid of equally spaced data rgb^*_d and LCH^*_d
 $rgb^*_d - LCH^*_d \sim LCH^*_d$ device linearization: $rgb_d \rightarrow rgb^*_d = rgb_{dd}$

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Three elementary (e) coordinates rgb^*_e describe 8 colours RGB_e, CMY_e , and NW .

Hexagon-triangle system based on elementary (e) colours: rgb^*_e with linear relations between $rgb^*_e - LCH^*_e$ (compare approximately linear relations between $rgb_{e,RGB}$ and L^*)
Equations $rgb^*_e - LCH^*_e$ in both directions have been published, see: Richter, CIE-Proceedings, Beijing, 2008, Volume 3 and DIN 33872-1
Three equations (tables) are needed for office applications:
 $rgb_d - LCH^*_d$ for a 9x9x9 grid of equally spaced rgb_d -input data
 $rgb^*_e - LCH^*_e$ for a 9x9x9 grid of equally spaced data rgb^*_e and LCH^*_e
 $rgb^*_e - LCH^*_e \sim LCH^*_e$ elementary linearization: $rgb_d \rightarrow rgb^*_e = rgb_{de}$

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input: w/rgb/cmyk $\rightarrow$ w/rgb/cmyk_d
output: no change