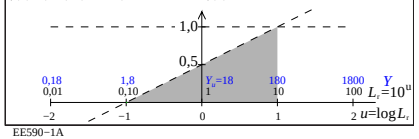
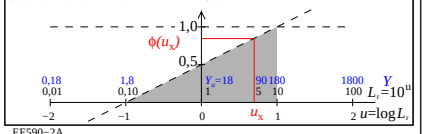
http://farbe.li.tu-berlin.de/EE59/EE59L0NP.PDF /.PS; only vector graphic VG; start output
see separate images of this page: http://farbe.li.tu-berlin.de/EE59/EE59.HTM

Density and distribution function for luminance and lightness
Density function $\varphi(u)$
$\varphi(u)=(1/2)\cdot 1$ $\varphi(u)$ [1]
area normalized to 1
Distribution function $\phi(u)$
$\phi(u)=(1/2)\cdot(1+u)$ $\phi(u)$ [2]



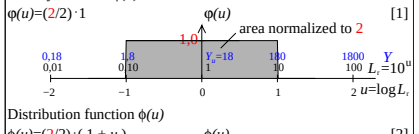
EE590−1A

Density and distribution function for luminance and lightness
Density function $\varphi(u)$
$\varphi(u)=(1/2)\cdot 1$ $\varphi(u)$ [1]
$\phi(u_x)=\int_{-1}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$
$\phi(u)=(1/2)\cdot(1+u)$ $\phi(u)$ [2]



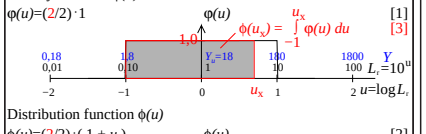
EE590−2A

Density and distribution function for luminance and lightness
Density function $\varphi(u)$
$\varphi(u)=(2/2)\cdot 1$ $\varphi(u)$ [1]
area normalized to 2
Distribution function $\phi(u)$
$\phi(u)=(2/2)\cdot(1+u)$ $\phi(u)$ [2]



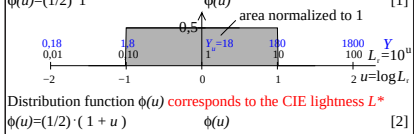
EE590−3A

Density and distribution function for luminance and lightness
Density function $\varphi(u)$
$\varphi(u)=(2/2)\cdot 1$ $\varphi(u)$ [1]
$\phi(u_x)=\int_{-1}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$
$\phi(u)=(2/2)\cdot(1+u)$ $\phi(u)$ [2]



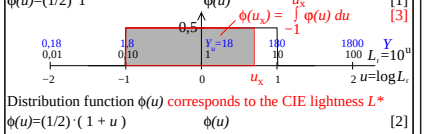
EE590−4A

Density and distribution function for luminance and lightness
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(1/2)\cdot 1$ $\varphi(u)$ [1]
area normalized to 1
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(1/2)\cdot(1+u)$ $\phi(u)$ [2]



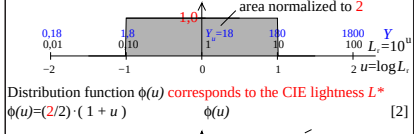
EE590−5A

Density and distribution function for luminance and lightness
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(1/2)\cdot 1$ $\varphi(u)$ [1]
$\phi(u_x)=\int_{-1}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(1/2)\cdot(1+u)$ $\phi(u)$ [2]



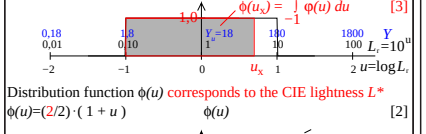
EE590−6A

Density and distribution function for luminance and lightness
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(2/2)\cdot 1$ $\varphi(u)$ [1]
area normalized to 2
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(2/2)\cdot(1+u)$ $\phi(u)$ [2]



EE590−7A

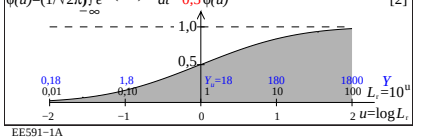
Density and distribution function for luminance and lightness
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(2/2)\cdot 1$ $\varphi(u)$ [1]
$\phi(u_x)=\int_{-1}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(2/2)\cdot(1+u)$ $\phi(u)$ [2]



EE590−8A

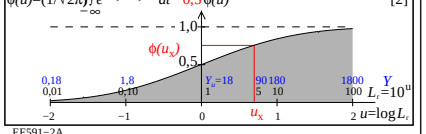
EE590−7N

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$
$\varphi(u)=(1/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
area normalized to 1
Distribution function $\phi(u)$
$\phi(u)=(1/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-0{,}5\,\phi(u)$ [2]



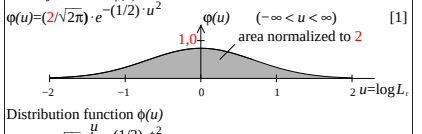
EE591−1A

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$
$\varphi(u)=(1/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
$\phi(u_x)=\int_{-\infty}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$
$\phi(u)=(1/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-0{,}5\,\phi(u)$ [2]



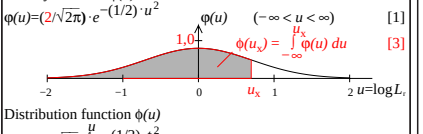
EE591−2A

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$
$\varphi(u)=(2/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
area normalized to 2
Distribution function $\phi(u)$
$\phi(u)=(2/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-1{,}0\,\phi(u)$ [2]



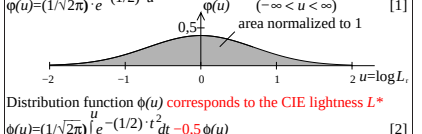
EE591−3A

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$
$\varphi(u)=(2/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
$\phi(u_x)=\int_{-\infty}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$
$\phi(u)=(2/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-1{,}0\,\phi(u)$ [2]



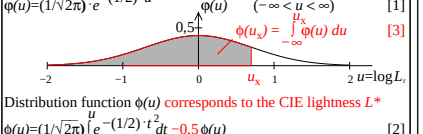
EE591−4A

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(1/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
area normalized to 1
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(1/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-0{,}5\,\phi(u)$ [2]



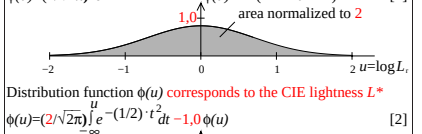
EE591−5A

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(1/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
$\phi(u_x)=\int_{-\infty}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(1/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-0{,}5\,\phi(u)$ [2]



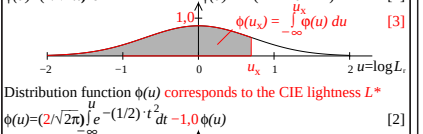
EE591−6A

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(2/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
area normalized to 2
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(2/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-1{,}0\,\phi(u)$ [2]



EE591−7A

Two standard normal functions according to *Gauß*
Density function $\varphi(u)$ compare with CIE luminance contrast $L/\Delta L$
$\varphi(u)=(2/\sqrt{2\pi})\cdot e^{-(1/2)\cdot u^2}$ $\varphi(u)$ $(-\infty<u<\infty)$ [1]
$\phi(u_x)=\int_{-\infty}^{u_x}\varphi(u)\,du$ [3]
Distribution function $\phi(u)$ corresponds to the CIE lightness L^*
$\phi(u)=(2/\sqrt{2\pi})\int_{-\infty}^{u} e^{-(1/2)\cdot t^2}dt-1{,}0\,\phi(u)$ [2]



EE591−8A

EE591−7N

see similar files of the whole serie: http://farbe.li.tu-berlin.de/EE.HTM
technical information: http://farbe.li.tu-berlin.de or http://color.li.tu-berlin.de

TUB registration: 20230801-EE59/EE59L0NP.PDF /.PS
application for evaluation and measurement of display or print output

TUB material: code=rha4ta

TUB-test chart EE59; Achromatic thresholds, contrast, and lightness
Contrast *(L/ΔL)* and lightness *L** according to *Weber-Fechner* and *Gauß*