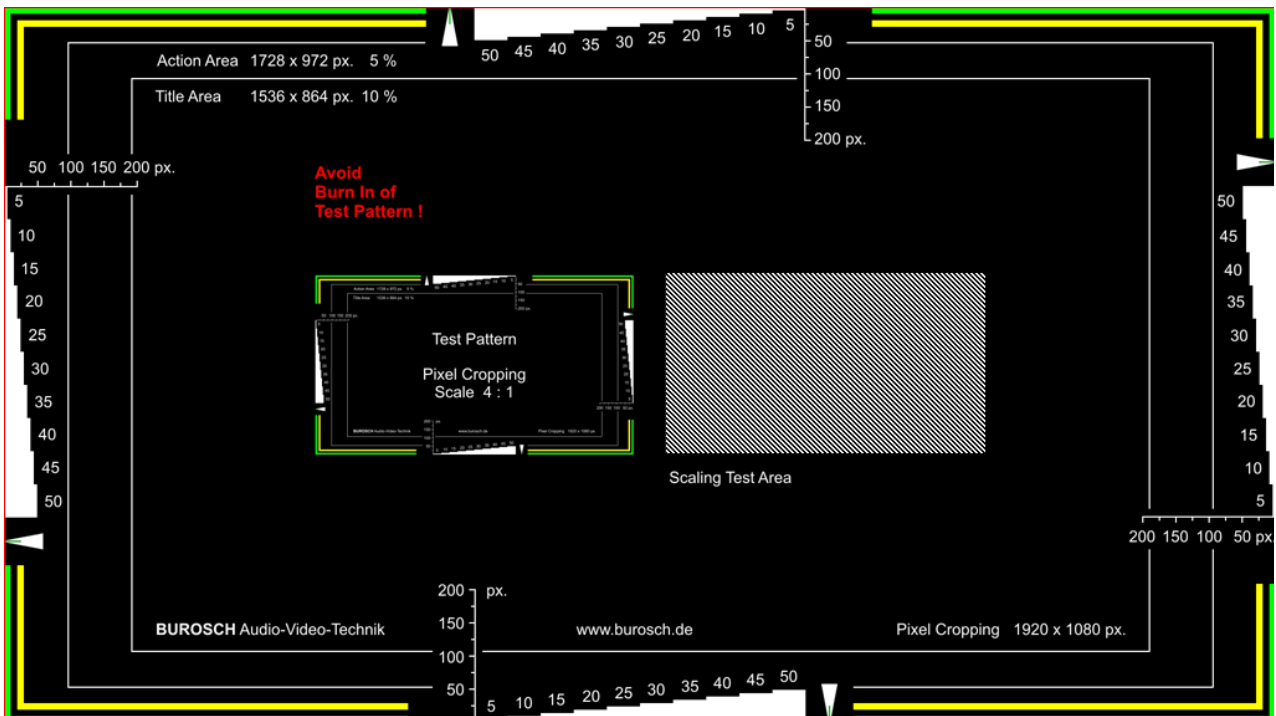


Pixel Cropping

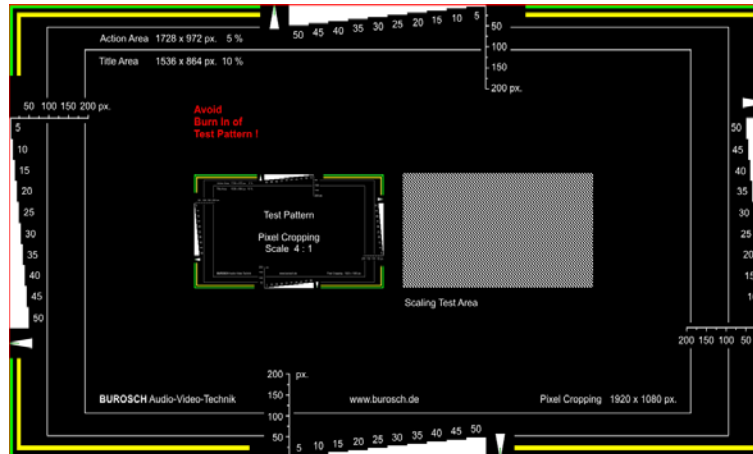
Reference Test Pattern



BUROSCH
Audio-Video-Technik

www.burosch.de

Test Pattern: Pixel Cropping



The pixel cropping test pattern shows a lot of possibilities for image calibration and quality evaluation without measurement devices especially for all what has to do with correct image illustration. The test pattern elements are optimized for simple interpretability and exact clearness of display.

The following aspects of the playback quality you can perceive in the Pixel Cropping test pattern or correct it by the help of itself:

- image size.....pages.....4, 5
- overscan.....pages.....4, 6
- lateral image off-set.....pages.....4, 5
- pixel exact exposition.....pages.....4, 7, 8

Before using the test patterns please check that all conditions come up with the later appliance, especially check the signal path and the light conditions. If you modify parameters for improvement of the image quality don't forget to save the modifications so that the changes become permanent. Please note the options of your image sender (e.g. DVD Player). Also try to get by with as few as possible of so-called image-improving features which distort the original image more than improve it.

Test Pattern: Pixel Cropping

Subsequent you find the description of the individual image elements and parallel the effect of possible image failures on a real image „Jasmin and Sabrina“.



In addition to many abstract technical test images this real image shows the typical problems and its effect on real, complex images. To clarify these problems there are heightened cut-outs of this image. On this page you see the image in correct exposition.

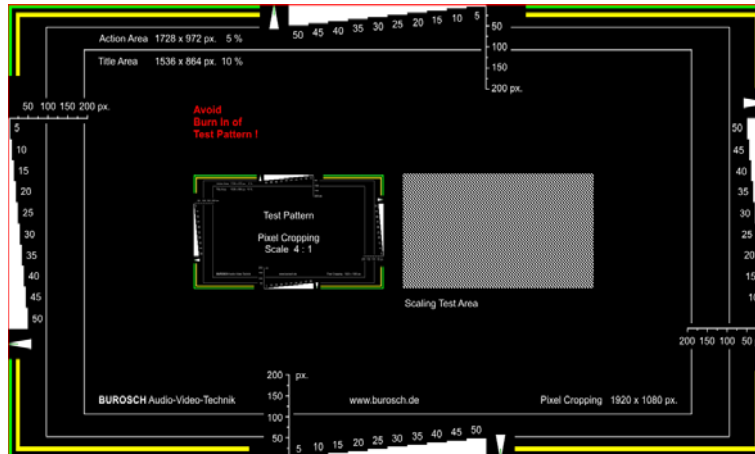
All images are evaluated to the screen evaluation standard ITU-R BT500-11 and shown as stars. This should give you an intuition for the heaviness of the shown difference to the original image:

Excellent	Good	Fair	Poor	Bad
★★★★★	★★★★★	★★★	★★	★
image is equivalent to original	No visible differences to original	Visible, uncritical differences to original	Highly visible differences to original	Image is not equal to original, indicate a loss of information

A very good playback string with applicable connections like HDMI or YUV component video should reach a quality of five stars, at worst four stars. Good digital sources over middle connections like scart-RGB or S-video shouldn't reach less than 3 stars on a good display, doesn't matter which technology – CRT, LCD, Plasma, DLP or projection. Correct wired, labeled devices should never fall to two or one star niveau at right adjustment. This is typically an unmistakable sign that there is a problem in the signal-string. It could be the configuration, calibration or other wrong adjustment or simply a defect. This needs to be checked once more.

Test Pattern: Pixel Cropping

Element-description:



Pixel Cropping

The Pixel Cropping test pattern shows all what have to do with image cutting. The Pixel Cropping test pattern make the size of the image measurable pixel accurately. In the middle of the test pattern you see a reduced image of the complete image and a stripe pattern. The outline markers measure the image cut which is shown with all image senders (e.g. DVD-Players) in PAL and NTSC. This cut is designated for a long time and will be considered by the cameraman and director. The „action area“, where the basic activity is must be shown within the border until 5% cut. All relevant written informations must be shown within the border until 10% cut.

Digital image sources like DVB, DVD, etc. can be prompt allegorized without overscan. For fine adjustment and fine measurement acting the revolving colored lines – yellow until 15 pixels, green until 5 pixels, red maximum 1 pixel from the outline of the image. For measurements of image skew serve the labeled steps on all 4 sides. A combination of cut and skew can be easily shown in the scales and to correct if necessary.

The stripes pattern of fine, diagonal lines in the middle is for detection whether still a scale process takes place. In this case blurring and/or interference will be generated. Only when a source-pixel hits a pixel of the image sender exactly, these test pattern is shown as constant lines.

Test Pattern: Pixel Cropping

Correct exposition:

- The test pattern is shown completely without cut on the image area.
- The test pattern is cutted until maximum 5% symmetrically
- The Scaling Test Area stripe pattern is shown pixel focussed as fine, diagonal lines without swapped interference pattern.

Typical failures:

- The test pattern is cutted on one or more sides more than 5% - overscan and/or the image skew wrong adjusted (not adjustable on all image senders)
- The test pattern is shown assymetrical on one side more cutted than on the opposited – image skew adjusted wrong (not adjustable on all image senders)
- Test pattern doesn't fill completely the image area – image format or scaler adjusted wrong (nicht an jedem Bildgeber einstellbar)
- The Scaling Test Area stripe pattern is shown only as gray area – blurred display because of strong scale or lacking band width
- The Scaling Test Area stripe pattern shows a swapped pattern, interference pattern – a scaling takes place, ideally you can turn it off.

Test Pattern: Pixel Cropping

Pixel Cropping – image cut (Overscan)

Typical failures:

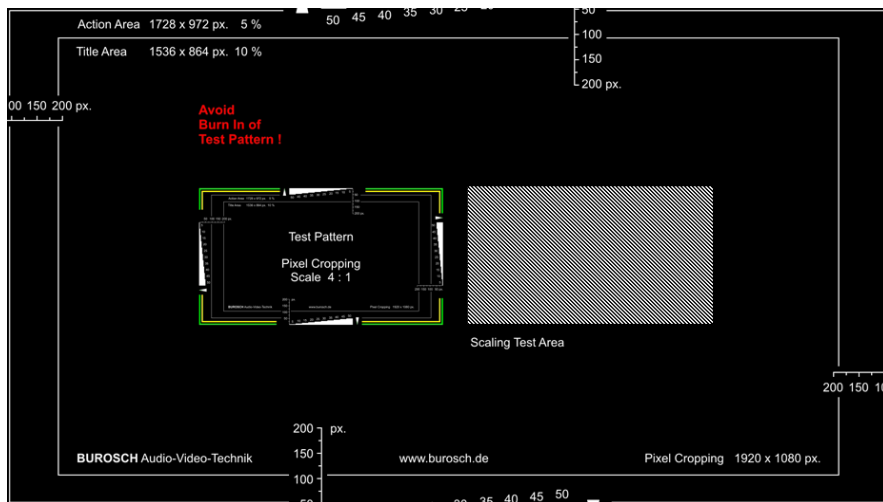


fig.1: In this example is the allowed cut (overscan) of 5% exceeded

The quality of this image is „good“ ★★★★★



The maximum allowed cut of 5% mustn't cost any relevant image contents at correct image composition

Test Pattern: Pixel Cropping

Pixel Cropping – image cut (Overscan)

Typical failures:

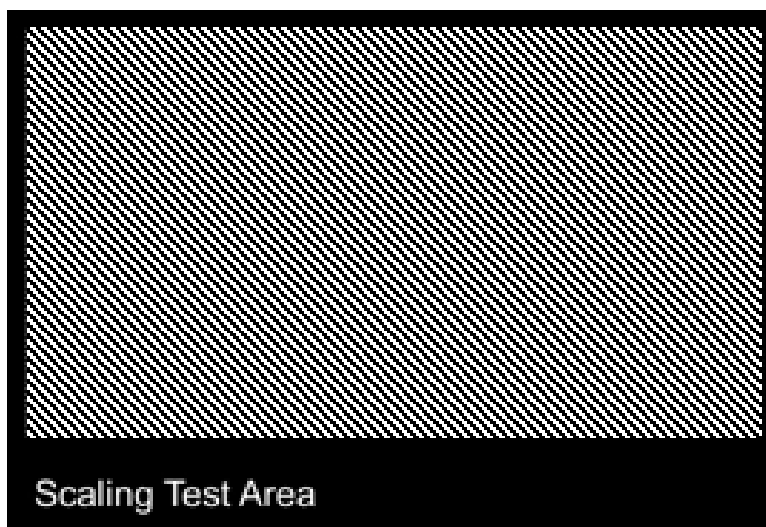


fig.2: This enlargement shows the Scaling Test Area in correct reproduction

The quality of this image is „excellent“ ★★★★★

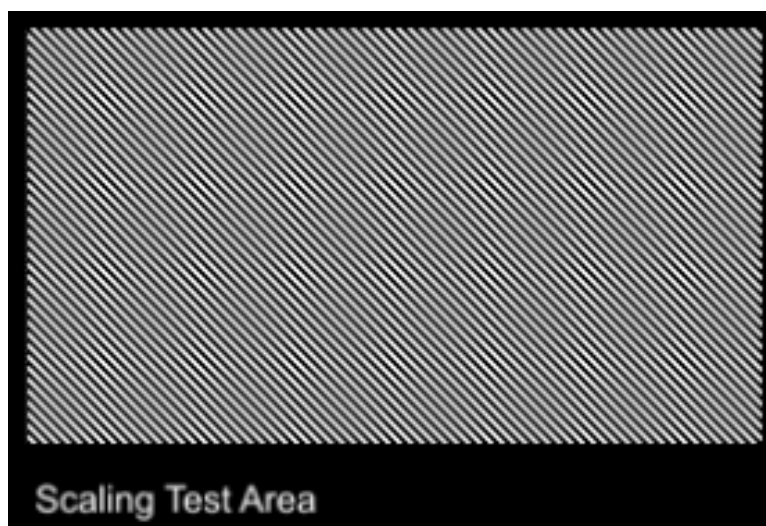


fig.3: This enlargement shows the Scaling Test Area at 3% scale. You see the interference pattern, the reduced sharpness and the reduced contrast of the lines clearly. As well the caption doesn't reach the optimal sharpness. This effect is in a film only visible on the fine, homogeneous structures

The quality of this image is „fair“ ★★★

Test Pattern: Pixel Cropping

Pixel Cropping – image cut (Overscan)

Typical failures:

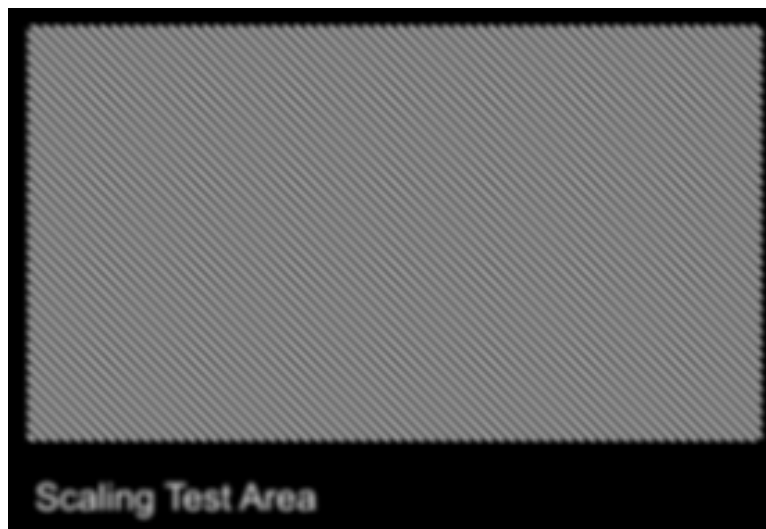


fig.4: This enlargement shows the Scaling Test Area after a strong scaling. The line pattern is barely visible, low-contrasted and blurred caption. In a film the exposition of fine details becomes reduced.

The quality of this image is „poor“ ★★



Here you can see a same-sized cut-out of the naturally motive, left in the original image, right with the same scaling like in figure 4.

Test Pattern: Pixel Cropping

Standards are helpful and important

For a correct playback of a film or a video or even of an image there have to be a neutral transfer. You often hear the argumentation that these isn't necessary because the vision of every human is different and so a objective playback isn't possible. As a matter of principle is this argumentation right. Admittedly there will be ignored that it's only possible if the signal transfer acts neutral and straight. Only when the expressed image is similar to the recorded image by the camera, the human is able to perceive what he would saw at location by his individual sensation.

The transfer itself have to behave neutrally. Big worldwide institues look after the standards so that the neutrality is warranted.

In german speaking countries is the institute for broadcast engineering of the public broadcasting corporation of ARD, ZDF, DLR, ORF and SRG/SSR mainly responsible for the standards:

www.irt.de

For the whole european area the European Broadcast Union, EBU in Switzerland handles superordinate to the local development institutes:

www.ebu.ch

On international floor established in 1865 in Paris the International Telecommunication Union, ITU is included:

www.itu.int

For best image evaluation and calibration you use the test pictures from this document. It works also with real, filmed motives but with reservations. The big advantage of test patterns from Burosch Audio-Video-Technik is the knowledge how the test patterns have to look and the knowledge how to reproduce them. Only this way the neutrality of the transmission and the playback can be measured exactly and if necessary to correct it:

www.burosch.de

BUROSCH

Audio-Video-Technik

Test Pattern: Pixel Cropping

BUROSCH Audio-Video-Technik

Klaus Burosch, Steffen Burosch, Andreas Burosch

Sigmaringer Str. 20
70567 Stuttgart / Germany

phone: +49 - (0)711 - 1618980
fax: +49 - (0)711 - 1618981
E-Mail: info@burosch.de
web: www.burosch.de

VAT Nr.: DE 147421720
Registergericht: Stuttgart / Germany
Handelsregisternummer: A 6322



Steffen Burosch, Eberhard Graf, Andreas Burosch, Klaus Burosch, Paul Gaukler, Raphael Vogt



We thank Mr. Prof. Dr.-Ing. M Planthold / application area: television systems University Wiesbaden for his help at the researching of the reference-testsignals for evaluation of the image quality from LCD and Plasma displays.

This contents are served for the private user who approve our general terms and conditions. The commercial use without our prior agreement is not allowed

This contents are only for editorial use and for individual information of the user. Without the prior agreement of BUROSCH Audio-Video-Technik it is forbidden to create copies of this document.

© Copyright 2007 All Rights Reserved