Info 32

studio industry nature architecture reproduction

sinar®

Quality points inside the view camera

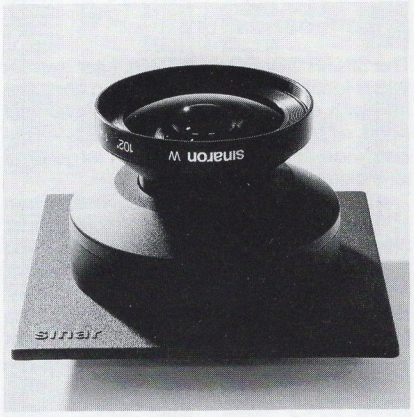
When the photographer pushes the film holder into his view camera and exposes a sheet of film, he is rarely aware how much he could improve his shot by keeping equipment and settings at their best. He lacks any comparison – and the knowledge what improvements could boost quality.
We heave therefore looked at all the critical points of the light path from the bellows hood through to the film holder.

The bellows hood

Using a hood can make an enormous difference to image brilliance, irradiation, detail definition and colour saturation of an exposure. When you shoot an object against a bright background, with back lighting or when you need catchlights for special effects, a properly used bellows hood can greatly improve the image quality.

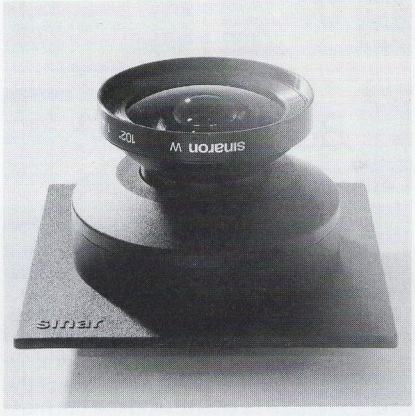
Recommendation:

To avoid unnecessary vibration, mount the hood as near as possible to the monorail itself. We recommend a bellows hood with its own standard. That way the hood automatically follows any inclination of the camera, is very stable, yet freely extendable. You can also insert filter holders and a bellows hood mask. The hood mask is the most effective way of screening off all light rays not actually involved in image formation. Locate the blinds of the hood mask exactly at the edges of the image area while looking through the cutout corners of the ground glass screen towards the centre of the lens. Do this at the lens's working aperture.



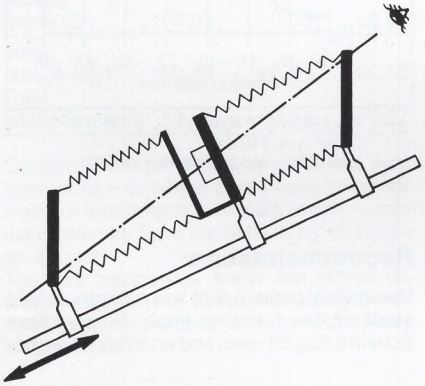
Example with extreme back light, using the bellows hood

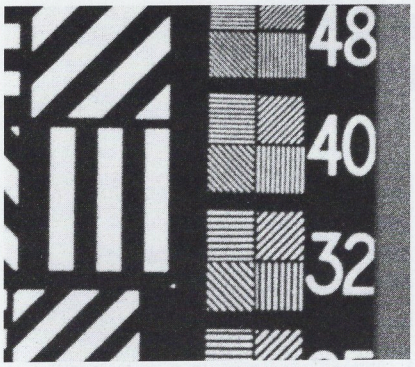
With bellows hood and bellows hood mask



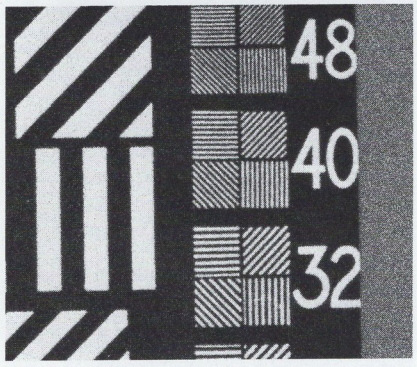
Same example without bellows hood

Without bellows hood



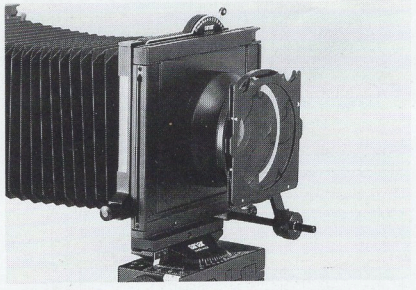


Example with SINAR COLOR CONTROL filter 125 mm, mounted in the bellows hood (20× enlarged)



Example with gelatine filter (20× enlarged)

SINAR COLOR CONTROL Filter 125 mm, mounted in the bellows hood



Gelatine filter, mounted in front of the lens

Filters

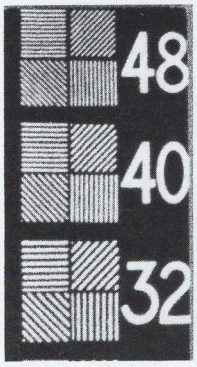
The examples demonstrate that it is worth using scratch-free, durable, plane-parallel filters rather than easily damaged gelatine filters. The quality difference in the developed image can be considerable.

Recommendation:

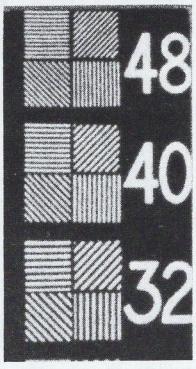
The SINAR COLOR CONTROL filter system 125 is ideal for view camera use in conjunction with effect filters and the bellows lens hood. It is also suitable for long-focus lenses and wide-angle systems with a large front lens diameter.
The SINAR COLOR CONTROL filter system 100 is universally suitable for rollfilm and 35 mm cameras. Use this size also behind the lens, in SINAR shutters or with appropriate behind-lens adapter rings and filter holders. That way the bellows protects the filter. And as absolutely no stray light reaches the filter, this eliminates all scattered reflections.

Lenses

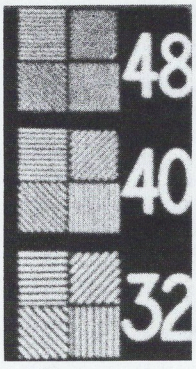
If you start by being careless over the hood and filter use, you certainly won't notice a great deal of difference in quality between an older type of view camera lens and a latest computer-designed and multicoated version. Making the best of the lens also depends on sharpness control with precise lens tilts and swings to allow the use of the largest feasible aperture. Find the optimum working aperture (not too large and not too small) with the depth of field scale while observing the image on a bright screen. If you habitually fudge these settings and stop down heavily to cover errors, the result with any old lens is the same as with an expensive modern type.
The 20× enlargements of the test target on a black-and-white negative show that using a modern 210 mm SINARON-S f/5.6 view camera lens at two stops larger improves the resolution by 15%. From the MTF curves it appears that modern lenses of the SINARON range yield optimum image quality at apertures between f/11 1/3 and f/22 1/3. Older lens systems – from before the days of computerised design and multicoating – are at their best between f/16 2/3 and f/32 2/3. But at all apertures their image performance is inferior to that of modern lenses (see test targets).



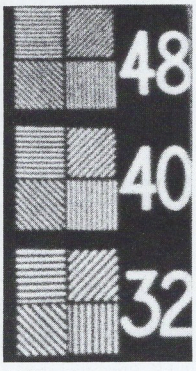
1: Modern lens type, f/16



2: Modern lens type, f/32

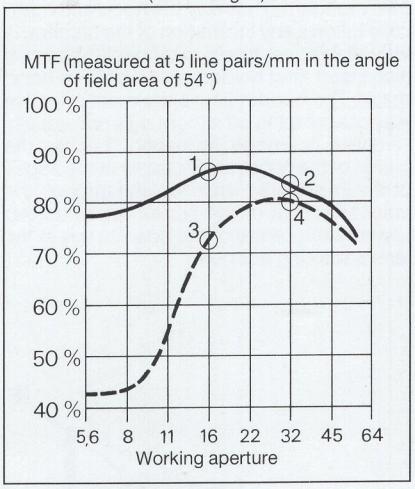


3: Older lens type, f/16



4: Older lens type, f/32

(20× enlarged)



—— SINARON S, 210 mm
- - - - Older-type 210 mm (pre-computer design era, pre-MC)

Recommendation:

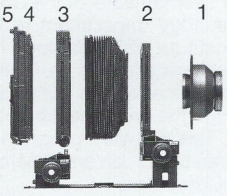
Use a view camera that has a depth of field scale on the focusing knob. If you follow Scheimpflug tilt rules and an efficient proce-

dure (such as the SINAR two-point focusing method) for optimum sharpness distribution control, you should be able to manage with minimum depth of field. That avoids the need for excessive stopping down – the result is a better performance.

Parallel camera planes

The precise parallel alignment of camera components is vital especially in copying and for the photography of planes that must reproduce parallel:

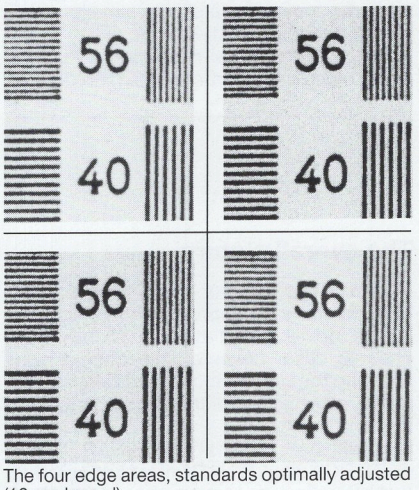
- The lens planes (1) must be parallel to the lens board, with the latter's mounting points all in one plane.
- When set to zero, the lens standard (2) and the rear image standard (3) must be parallel to each other.
- The ground glass screen frame (4) must be parallel to the rear standard (5), as must the ground glass screen plane.



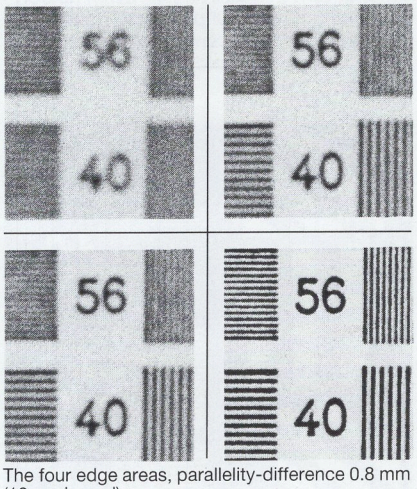
Every camera component is subject to manufacturing tolerances. In a new SINAR p2 the permissible deviations from parallelism are:

Format	4×5″	13×18 cm	8×10″
	mm	mm	mm
Lens mounting (1)*	±0.10	±0.10	±0.10
Lens standard (2)	±0.10	±0.10	±0.10
Image (rear) standard (3)	±0.10	±0.15	±0.20
Film holder frame (4)	±0.05	±0.10	±0.10
Screen frame (5)	±0.05	±0.05	±0.05
Total (absolutely)	±0.40	±0.50	±0.55
Total (statistic mean)	±0.19	±0.24	±0.27

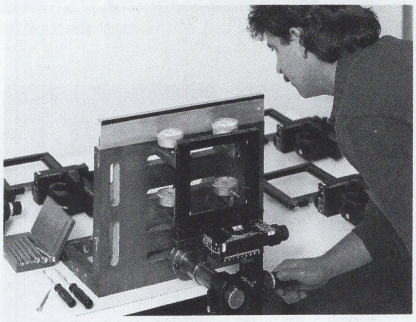
Cameras not produced to SINAR's tight tolerances – or where errors have arisen by wear or uncorrected misalignment – can easily deviate from parallelism by as much as ± 1 mm.
The two exposures show the effect on image definition in a 1:5 reproduction on 4×5″ film, shot with a 150 mm SINARON lens at f/5.6.



The four edge areas, standards optimally adjusted (10× enlarged)



The four edge areas, parallelity-difference 0.8 mm (10× enlarged)


Adjusting of the SINAR standards

Recommendation:

Check the parallelism of your camera, with the movements in zero position: Set it up exactly vertically, focused at close range on a facing vertical mirror, aligned with equal precision. Find any focusing deviation between the four edge areas of the screen. If on a 4×5″ image the focusing difference is more than 0.8 mm, have your camera readjusted by an approved servicing workshop. (This assumes that your camera can be adjusted with sufficient precision.)

Film holders

We normally assume that the emulsion surface of the film located in the film holder in the camera is in exactly the same plane as the screen on which we focused the image. Depending on the product, that is also subject to comparatively substantial tolerances:

4×5″ sheet film holders

	Typical tolerances of conventional 4×5″ sheet film holders	Tolerances of 4×5″ SINAR sheet film holder (avail. mid-1989)
Location of rear film surface	+0.30 mm −0.10 mm	–
Film thickness	± 0.04 mm	no effect
Location of front film surface	–	± 0.03 mm
Film curvature	0 mm −0.30 mm	± 0.07 mm
Play in the guiding slot	0 mm −0.20 mm	–
Total absolute tolerance	+0.34 mm −0.64 mm	± 0.10 mm
Total statistic mean tolerance	+0.19 mm −0.36 mm	± 0.08 mm

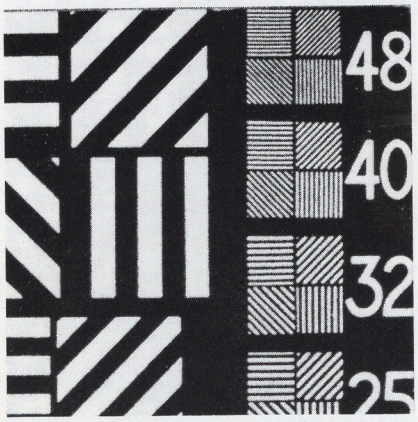
Rollfilm magazines for No. 120/220 rollfilm

	Typical tolerances of conventional rollfilm magazines	Tolerances of SINAR rollfilm magazines, fixed format, vario, zoom
Location of front film surface	± 0.07 mm	± 0.07 mm
Film curvature	± 0.10 mm*	± 0.06 mm
Total absolute tolerance	± 0.17 mm	± 0.13 mm
Total statistic mean tolerance	± 0.12 mm	± 0.09 mm

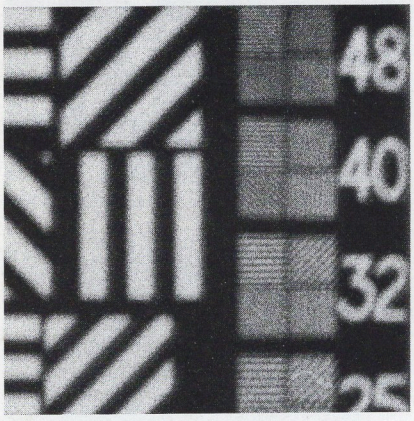
* in DB mount, otherwise ±0.15 mm

* Not counting any curvature caused by film set ahead of the film gate.

The close-ups of the test target photographed with the 150 mm SINARON at f/5.6 show the difference between the two statistic mean tolerances.



Best possible position of the film in the film holder (20× enlarged)



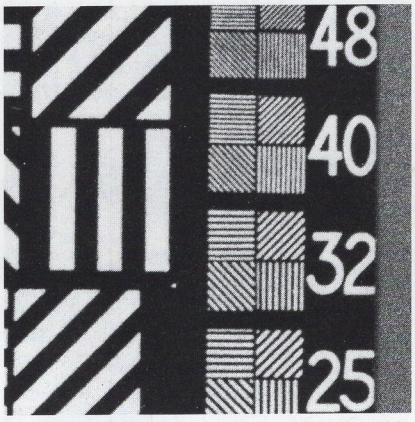
Film 0.3 mm out of the optimal position in the film holder (20× enlarged)

Recommendation:

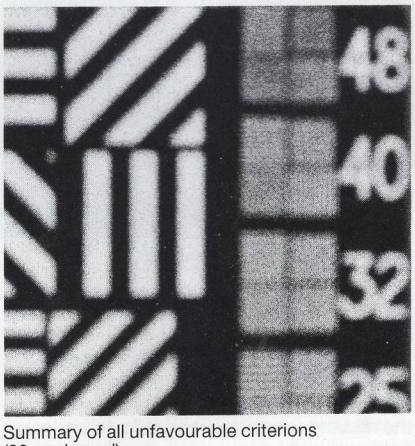
The shorter the focal length and the larger the lens aperture, the more important is precise matching of the film plane to the ground glass screen plane.
Focusing itself on the screen is a subjective visual process; various people may differ in judging the point of maximum sharpness. Repeated focusing even by the same person can yield slightly different focusing points. The likely error spread is about ±0.2 mm. It is worth the trouble to focus meticulously, using suitable screen viewing aids such as the binocular reflex magnifier, binocular magnifier with wide-angles bellows, Fresnel screen, etc.
The depth of field scale of the SINAR cameras is designed to compensate focusing errors by indicating a slightly smaller aperture that required in theory.
For shots where detail resolution is vital, it is worth using precision-made film holders.

The overall picture

Naturally every factor mentioned contributes its share to improving image quality. Actual deviations may vary slightly from case to case; however, the comparisons show up the dramatic quality difference between allowing for all the factors listed and ignoring them.
Shot with bellows lens hood, SINAR COLOR CONTROL filter, SINARON lens at optimum aperture, recently factory-aligned SINAR p2 camera, SINAR sheet film or rollfim holder.
Shot without hood, unprotected gelatine filter, older lens type, camera with poor parallelism, sheet film holder with appreciable deviations.



Summary of all criterions at the most favourable (20× enlarged)



Summary of all unfavourable criterions (20× enlarged)

Large-format view cameras with camera movements offer immense scope for creative image control. View camera pictures speak for themselves; they are the hallmark of professional photography. But where quality counts in a photographic assignment, the above study of contributing factors clearly demonstrates the importance of quality points inside the view camera.

If you want the whole story

There are usually numerous possible camera settings for dealing with a given photographic job. Certain rules indicate the interaction of all the variable data available within a specified range. Till now there has been no way of working out the optimum combination of all values. Experienced photographers believe that they arrive intuitively at or near the optimum settings. From the point of view of regularity this is unfortunately an illusion – but in the absence of comparisons with the optimal solution there is no understanding for this.
Prof. Dr. F. Tomamichel of the Communication Technology department at the Zürich Federal Institute of Technology has traced all the significant factors, established their interdependence and, in collaboration with SINAR, used the results to set up a software package. This software program is easy to use and can be run on any IBM-compatible Personal Computer.
Starting from the dimensions of the object to be photographed, and using data for the camera, lens, film and other details, the program suggests step by step the necessary exposure data for the best possible image. By interaction with the PC program you can thus assemble the optimum shooting data for any picture. A first "Product shots" software package is available from SINAR AG SCHAFFHAUSEN and local agencies. Further software programs are in preparation.

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