

H A S S E L B L A D[®]

LENSES



HASSELBLAD LENSES

For a fleeting second, everything is just right: the subject, composition and lighting.

The camera operates in a fraction of a second during its efforts to record the photographer's intentions on the film. Hundreds of mechanical parts have to work with split-second timing in exactly the right sequence in order to expose the film with a predetermined amount of light. The precision of all these parts obviously has to be of the highest order. But the lens, i.e. the camera's "eye", plays the biggest role in determining image qualities such as resolution, contrast and saturation. On the other hand, no lens is at its best unless the camera is right up to the mark.

The Hasselblad name is closely linked to the lens makers Carl Zeiss and Jos. Schneider, West Germany. Attach another lens brand to a Hasselblad and you no longer have a true Hasselblad.

Making camera lenses calls for years of experience plus practical and theoretical know-how only time and traditions of optical excellence can provide. That is why Hasselblad picked these two manufacturers to supply lenses for Hasselblad cameras.

Choice of lens

"The right lens, attached at the right moment is essential to my powers of creative expression." This view was expressed by a photographer who always keeps a wide range of lenses in his camera bag. His work as an allrounder requires him to cover a wide range of assignments. He doesn't want to be hampered by a lack of suitable equipment. Many photographers are not really aware of their own potential. They work with a limited number of lenses, thereby limiting the options open to them. A new lens, a new focal length, can open up new horizons, but it also provides the impetus for attempts to find new means of expression.

Modern T* lenses

Many modern lenses are based on old formulas, and their designs have remained un-

changed over the years. The biggest innovation in recent years was the introduction of multicoating. Hasselblad lenses with this feature are engraved with a red T*. All Hasselblad lenses (except two special-purpose optics) are now multicoated. Many photographers with especially stringent demands have traded in their older lenses for new multicoated models. This new technique has many advantages. The ensuing reduction in flare results in greater color saturation, whiter whites, blacker blacks and a reduction in ghost images. The characteristic five-pointed star (a rendition of the iris diaphragm) previously commonplace in backlit shots is also counteracted by multicoating. The result is enhanced image brilliance and better resolution than ever before. The new generation of T* lenses has also been improved in other ways. The diaphragm leaves and the shutter blades have been given a very dull black finish to prevent internal lens reflections. This factor also contributes to enhanced imagery.



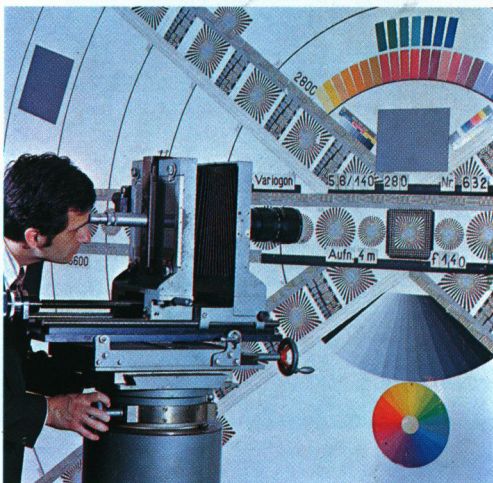


Lens grinding

The components of optical glass are melted in a crucible and form a homogeneous mass capable of diffracting light. The grinding process results in elements with the exact optical properties specified by the lens designer.

Lens grinding and polishing are time-consuming processes which must be carefully monitored and controlled. Polishing has to be terminated at just the right moment when the lens has achieved its predetermined shape.

Photo: Carl Zeiss



Lens quality control

No lens is allowed to leave the plant without having been subjected to exhaustive quality control. The picture left shows a final check being made on a 140—280mm Variogon f/5.6 lens at the Schneider Works.

Each lens has already been subjected to a large number of adjustments and tests before it gets this far. The individual lens elements have been carefully centered along their optical axes and elements cemented into groups in air-conditioned, dust-free rooms.

The performance of the finished lens is also highly dependent upon the precision engineered lens mount. Photo: Werbefoto Thomke (Schneider)



Lens quality control

A Hasselblad leaf shutter lens should lock onto a 500C bought in i.e. 1957 with the same solid precision as onto a Hasselblad camera bought today. So scrupulous quality control is essential. In the Hasselblad quality control department every single lens is checked out a hundred per cent prior to shipment. This department checks shutter speeds, the bayonet lens mount, the accessory mount, flash synchronization and last but not least the key which interconnects the camera and lens mechanisms. Faulty lens specifications may cause damage to both camerabody and lens.

Photo: Bo Timback



Hasselblad, an international byword in the field of medium-format photography. A camera system with more than 200 components for the basic $2\frac{1}{4} \times 2\frac{1}{4}$ format. Four camera models form the pillars of the system.

The 500C/M is the basic Hasselblad, a single-lens reflex camera with manual film winding and shutter cocking. The SWC (Super Wide C) is the system's special wide-angle camera with a permanently attached 38mm f/4.5 Biogon lens (90° diagonal and 72° horizontal angle of view). It features an optical viewfinder plus manual film winding and shutter cocking. The Hasselblad 500EL/M is the system's motorized model.

Its built-in winder keeps the camera cocked and constantly at the ready.

The Hasselblad 2000FC is the latest addition to the Hasselblad line. You can elect to work with the camera's electronically timed focal plane shutter at speeds from 1 to 1/2000 s or the leaf shutter in the camera lens.

Virtually total interchangeability has been and remains a keynote in the evolution of the Hasselblad system. The photographer's need for maximum flexibility is always kept to the fore.

Flexibility in the choice of format, for example. The system has film magazines for



Photo: Jens Karlsson

2 1/4 × 2 1/4, 1 5/8 × 2 1/4 and 1 5/8 × 1 5/8 plus magazines for Polaroid film.

Flexibility in the choice of focusing screens and viewfinders.

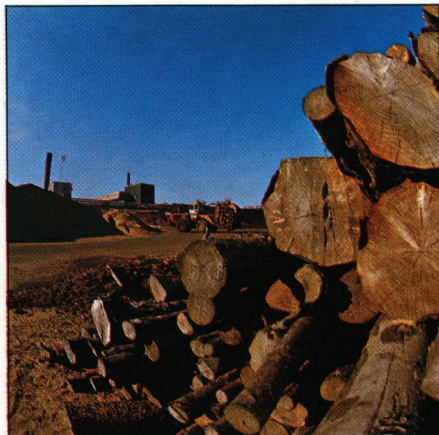
Flexibility too in the choice of lenses capable of translating photographic ideas into photographic imagery in any given situation.

The Hasselblad system has 15 fully synchronized leaf shutter lenses with speeds from 1—1/500 s and B. (When these lenses are used on the 2000FC you even gain access to speeds down to 1/2000 s.)

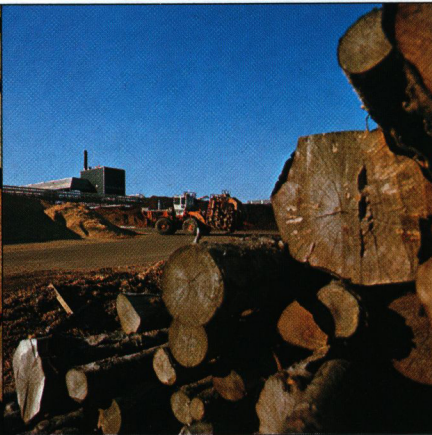
Lens focal lengths span a range from 30

mm (fish-eye) to 500 mm (tele-photo). This gives you diagonal fields of view from 180° to 9°.

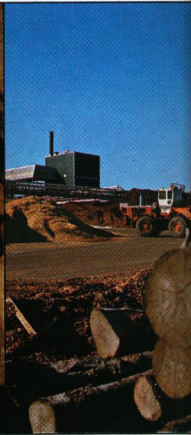
There are a number of special-purpose lenses in the line. But all the Hasselblad lenses have certain features in common. Outstanding optical performance, for one. And mechanical precision, essential in maximum utilization of optical performance, is another. The matched color correction of the lenses enables you to switch from optic to optic with no discernible difference in color rendition. The non-reflecting, matt-black finish on lens barrels and mechanical functions are described at the back of this booklet.



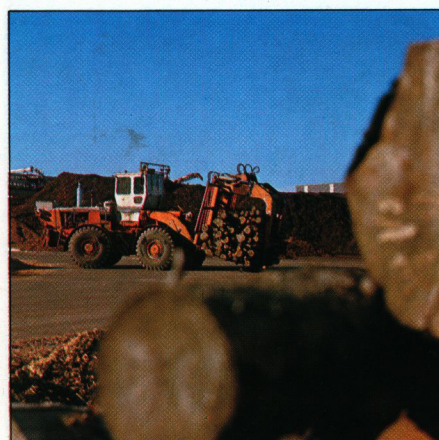
30 mm



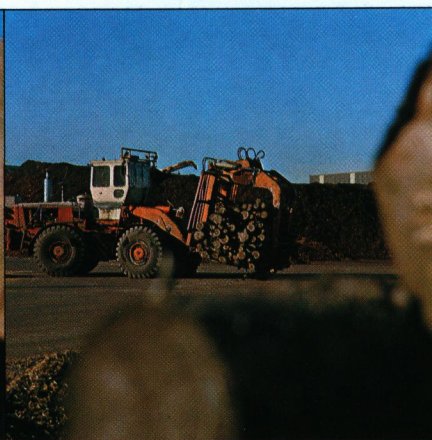
40 mm



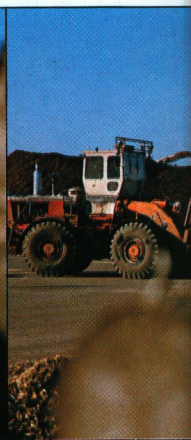
50



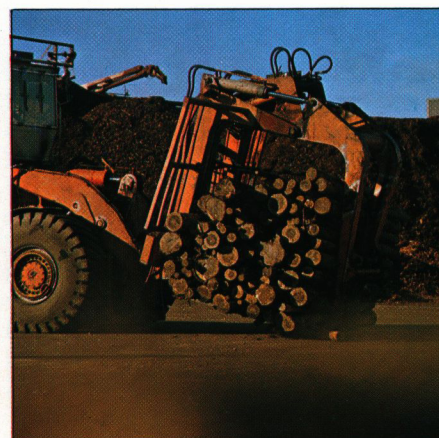
100 mm



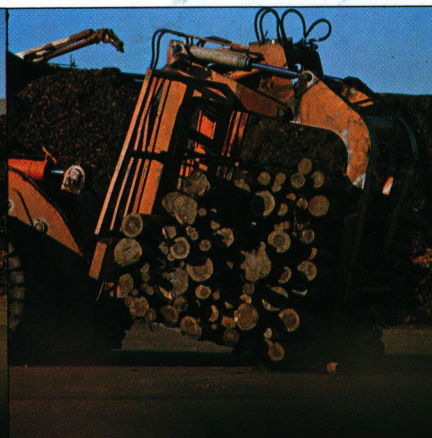
120 mm



130



280 mm



350 mm

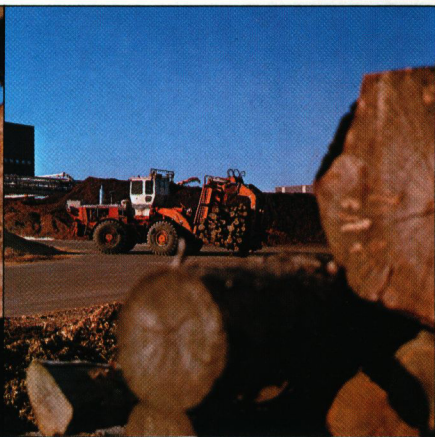


500

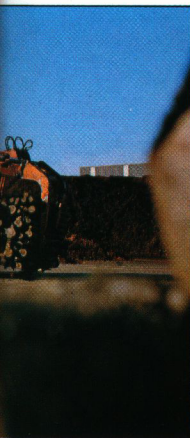


30 mm

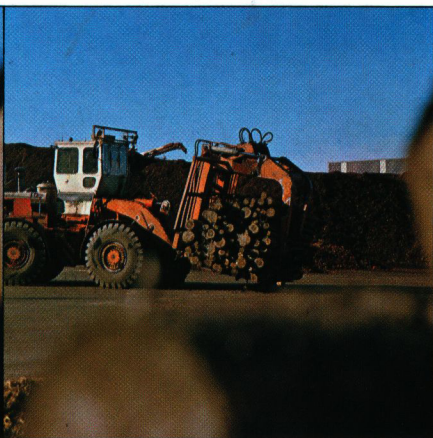
60 mm



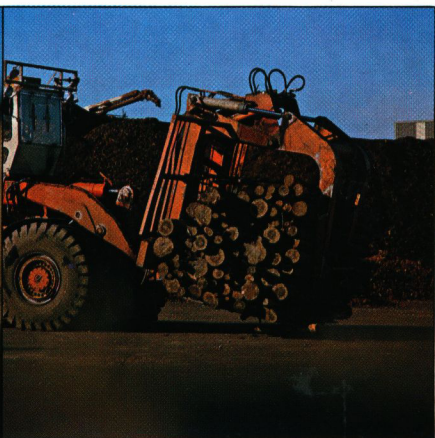
80 mm



150 mm



150 mm



250 mm

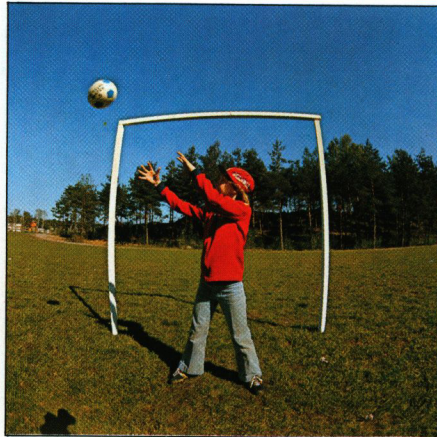


500 mm

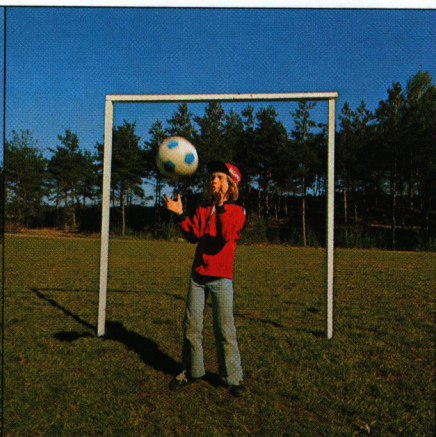
Every photograph in this sequence was taken from the same camera site using Hasselblad lenses from 30 to 500 mm with diagonal angular fields ranging from 180° to 9°. You can clearly see how the truck with its load of lumber gets closer with every

lens change and how depth-of-field declines. Perspective is the same in each image, even if this is not immediately apparent at a casual glance. Notice how color rendition remains unchanged from lens to lens.

Photo: Jens Karlsson



30 mm



40 mm



50



100 mm



120 mm



135



280 mm



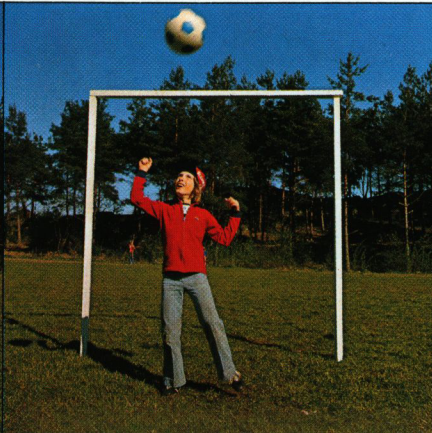
350 mm



500



m



60 mm



80 mm



m



150 mm



250 mm



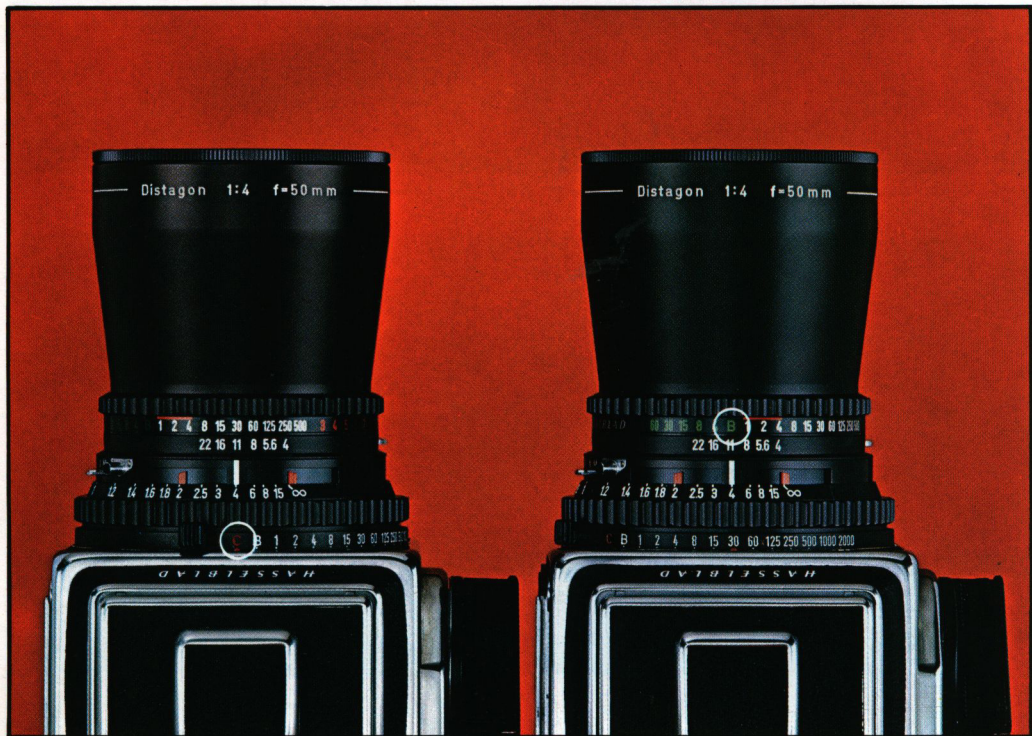
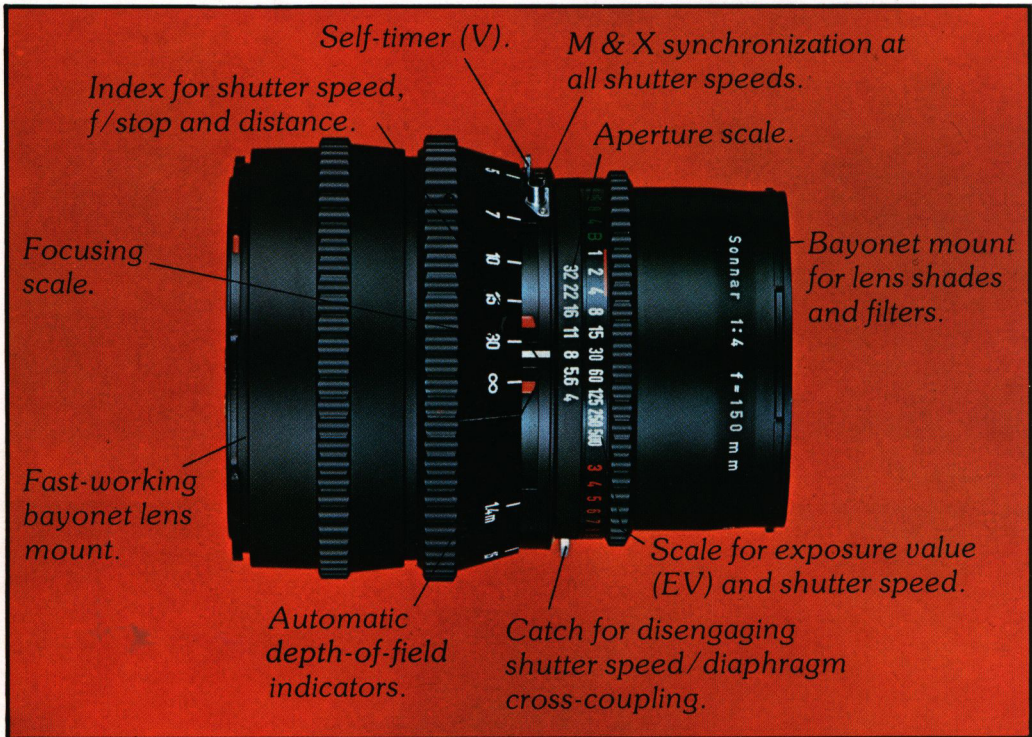
m

In contrast to the preceding sequence, the camera in this sequence was backed off a few steps between each take with a different lens to illustrate the background's change in perspective. Nevertheless, the goalkeeper fills the frame to the same degree in each picture.

In the first shot, the photog-

rapher is only about a yard from his subject. In the last shot he's almost 33 ft away. But his subject still retains the same size in each shot. And, as in the preceding sequence, depth-of-field can be seen to decline as the lens' focal length increases.

Photo: Bo Timback



Lenses with leaf shutters

Lenses are attached and removed from the camera with a mere 1/5 of a turn of the rugged, high-precision bayonet mount. Lens attachment results in automatic coupling of camera and shutter mechanisms. Depth-of-field indicators automatically display the depth-of-field yielded at every f/stop.

The shutter and diaphragm settings are cross-coupled so that the diaphragm opens to a corresponding degree when faster shutter speeds are selected. The cross-coupling can be disengaged at the press of a catch. Shutter speed, f/stop and distance are read against the same index on the top of the lens barrel. The optic is focused wide open but can be stopped down to the preselected working aperture for depth-of-field preview.

The shutter is fully synchronized (M & X) so that you can work with flash at shutter speeds from 1 to 1/500 s. The shutter also has a self-timer yielding a delay of 8—10 s.

Hasselblad 2000FC

The advent of the Hasselblad 2000FC has greatly expanded the range of use for leaf shutter lenses in the Hasselblad system. These lenses are attached to the 2000FC in the same way as to a 500C/M or 500EL/M. But the electronically timed focal plane shutter in the 2000FC actually gives you the choice of two shutter options. You can work with the leaf shutter in the lens to permit the use of i.e. flash at a fast shutter speed or of the self-timer. In this case, the camera's shutter speed ring is set at C (camera to the left), and the shutter speed and aperture for exposure are set on the lens.

You can also decide to use the camera's focal plane shutter instead, providing access to fast 1/1000 s or 1/2000 s shutter speeds. In this case the shutter speed ring on the lens is set at B. The desired f/stop is set on the lens. The shutter speed for exposure is now set with the camera's shutter speed ring. Notice how all the scales, i.e. for shutter speed, distance, depth-of-field and aperture are all conveniently grouped for reading at a glance from above.

Special-purpose lenses

There are 4 special-purpose lenses in the comprehensive Hasselblad lens line.

The **120mm f/5.6 S-Planar** features optimum optical correction at short lens-to-subject distances. It is ideal for i.e. copying work where demands on accurate reproduction and image fidelity are more stringent than in ordinary pictorial photography. At long lens-to-subject distances the lens should be stopped down to yield the best optical results.

The **135mm f/5.6 S-Planar** has no built-in focusing mount and is designed for use with the bellows extension. Like the 120mm f/5.6 S-Planar, this lens has been corrected to yield its best results at close focusing distances and reproduction ratios down to 1:1. It can also be used at longer focusing distances, but small f/stops are then advisable.

The **105mm f/4.3 UV-Sonnar** is a very special lens. Its elements are made of quartz and fluorite providing excellent transmission in the ultraviolet range of the spectrum. It was especially designed for use in this spectral range, i.e. from 215—400 m μ . Its superlative correction for chromatic aberrations makes the lens equally suitable for use in visible light.

250mm Sonnar Superachromat f/5.6

This lens features hitherto unsurpassed correction for chromatic aberrations, optical faults notoriously difficult to overcome in long focal length lenses. Its correction spans the entire visible spectrum and extends into the infrared range (400—1000 m μ). The Sonnar Superachromat is especially useful in infrared photography since adjustments in focus are unnecessary. The unique resolution of this lens also makes the optic suitable for conventional photography, especially when big blow-ups have to be made from a negative/transparency.

VICTOR HASSELBLAD AKTIEBOLAG

Box 220 S-401 23 Göteborg Sweden

Working with a leaf shutter is often the only way to tackle certain photographic problems. The flash shot below is one example. By choosing a suitable f/stop, the photographer determines the effect of flash output on the subject and depth-of-field. The contribution of daylight to exposure is governed by the choice of shutter speed. Hasselblad leaf shutter

lenses are synchronized for flash at speeds from 1—1/500 s. Judicious selection of the shutter speed makes it possible to attain a balance between flash and daylight so that only the highlight in the girl's eye betrays the use of flash fill-in.

Photo: Jens Karlsson

