

# INTO THE BIG WIDE OPEN

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PHOTO: JÜRGEN MÜLLER

The new HCD 4/28 lens in the H series represents Hasselblad's long-awaited entry into extreme wide-angle photography. This lens – a digital exclusive – was designed with certain digital processes in mind, leading the company through unknown technical territory.

The tiny gap that once existed in the selection of wide-angle lenses in Hasselblad's H system has now been filled. Mounted on a film body, the existing HC 3.5/35 will yield an expansive 89-degree angle of view – enough to capture anything from vast scenic views to extreme close-up portraiture with exaggerated proportions. The digital H3D series, however, is affected by a lens factor that alters the perspective of a focal length both when compared to film and 48mm 'full format'. The digital H3D-22 and -39 – which hold the full-format title – do in fact yield a lens factor of 1.1; and while moderate, it will transform the 35mm mentioned above into a hypothetical '38.5mm' lens. But 38 millimeters fall short of the extreme 90 degree, or more, angle of view necessary in order to qualify for 'the big wide open'. The marginally smaller sensor of the brand-new H3D-31, by comparison, has a lens factor of 1.3 and is therefore affected similarly.

The newly introduced HCD 4/28 serves to fill that last gap in the lens gamut. Mounted on an H3D-22 or -39, the 28mm opens up to a superb 95-degree angle of view. In 35mm terminology this would correspond to a 20mm lens. The H system now measures up to digital 35mm cameras in one of the most important arenas of photography: the wide-angle zone. The new HCD 4/28 safeguards exceptional picture quality, zero distortion and crisp detail throughout the full image plane – at every range.

## SMALL, SOLID, AFFORDABLE

**1** The HCD 4/28 is small, solid and affordable all at once. To some this may come as a surprise. "HCD" hints at the technical trick to which the

28mm owes its compactness. 'D' stands for digital and signifies that it works with digital Hasselblad cameras only – the new H3D models to be exact. Since most photographers will have converted to digital by now, the fact that the 28mm is designed exclusively for digital operation is less restricting than in recent years. In the end, it is this restriction that raises the photographic reproduction as a whole to a higher level. Per Nordlund talks about this in a comprehensive interview on page 42.

The 28mm is so wonderfully compact precisely because of its limited compatibility, as it focuses only on the smaller image circle of digital sensors. While the 49.1 x 37 millimeter size of the sensor (H3D-22 and -39) is not much smaller than the 56 by 42 millimeters of the film frame correcting a 28mm lens for the entire medium format film plane – in spite of what appears to be a negligible difference in size – demands a substantially larger lens shell, along with wider, more expensive glass diameters. This is the reason why Hasselblad decided to build a lens for digital sensors only, making the HCD 4/28 the first to be designed specifically for the 48mm full format. Mounted on an analogue body would only result in a reduction of brightness in the image periphery. Digitally, however, the 28mm will fully illuminate the smaller image circle of the sensor.

Once it had been established that the new 28mm lens was to be a digital exclusive, Hasselblad took it one step further, bumping up the lens design with a few digital tweaks and, in doing so, exploiting the potential of the digital medium. Fully aware that it would need DAC to counteract a slightly greater lens distortion than usual, the team of engineers decided to make it their priority to achieve

minimum chromatic aberration and maximum resolution. Any distortion was to be corrected digitally. Had the priority been lowest possible distortion, the lens would have turned out substantially more complex; bulkier, heavier and pricier. It would have altered the nature of the lens design process. The result – the HCD 4/28 with DAC implemented from the start – is probably a better lens than a hypothetical, DAC-less 28mm could ever be.

## DIGITAL DISTORTION CORRECTION

**2** It is worth pointing out that the distortion factor is the HCD 4/28's only 'weakness'. In all other disciplines of photography – when it comes to the chromatic aberration or refining the reproduction in close range, for example – the lens is just as good, if not better than those HC lenses that are already prized for their capacity to deliver immaculate results on film. According to Hasselblad, the HCD 4/28 really only distorts slightly more than the HC 3.5/35 and is still within acceptable limits. Those who persist will find a subtle bend in the viewfinder periphery, where otherwise straight lines take on a moderately barrel-shaped distortion; but this will not affect the composition in any way.

Hasselblad moves on to perfect the picture with software, starting with an automated removal of distortion. This happens without the photographer ever noticing and is free of side effects, as the Digital Auto Correction (DAC) is an integral element of the FlexColor software, which he uses to manipulate the picture after the exposure. The digital auto correction removes those very last optical aberrations that are inherent in the

construction of a lens, no matter how scrupulously designed. All HC lenses utilize DAC, but the HCD 4/28 is the first Hasselblad lens to rely on DAC for outstanding picture quality.

For the time being, the digital auto correction resolves two – soon three – typical optical aberrations. The first DAC level has long established a footing in the image formation sequence and stands for 'Digital Apo Correction'. It eliminates residual chromatic aberrations induced by optical constraints that cannot be avoided, regardless of how zero-tolerance oriented the HC lens designs are. DAC practically eradicates the residual purple fringing, occasionally caused by chromatic aberration. The second, recently introduced level of the digital auto correction system counteracts the described inherent distortion of HC lenses. The same principle applies: almost any lens will distort if the conditions are right, causing straight lines in the viewfinder periphery to warp. However, all HC lenses are designed to keep distortion to an absolute minimum, even without the interference of corrective software. Only the HCD 4/28 finds itself slightly below what is commonly accepted by professionals – for this reason, DAC plays a crucial part in the design process.

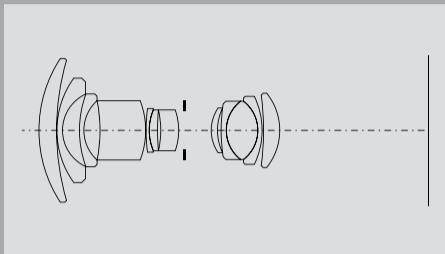
Hasselblad intends to launch a third level of correction: DAC III will deal with vignetting, i.e., declining brightness towards the corners of the image. While chromatic aberration and distortion are never welcome, vignetting is a frequently accepted, occasionally even desirable photographic 'error'. So Hasselblad plans to include a slider for the adjustment of vignetting, allowing the photographer to fully eradicate the peripheral reduction in brightness or, if desired, enhance it. While this FlexColor feature awaits to be integrated, all HC lenses – including the HCD 4/28 – yield very little vignetting as it is, even without DAC. DAC is only ever responsible for that last drop of quality, turning an already great picture into an immaculate one.

The new HCD 4/28 beckons owners of H3D cameras into the realm of extreme wide-angle photography, offering an enormous angle of view of 95 degrees – without being as big a build as it may seem in this picture

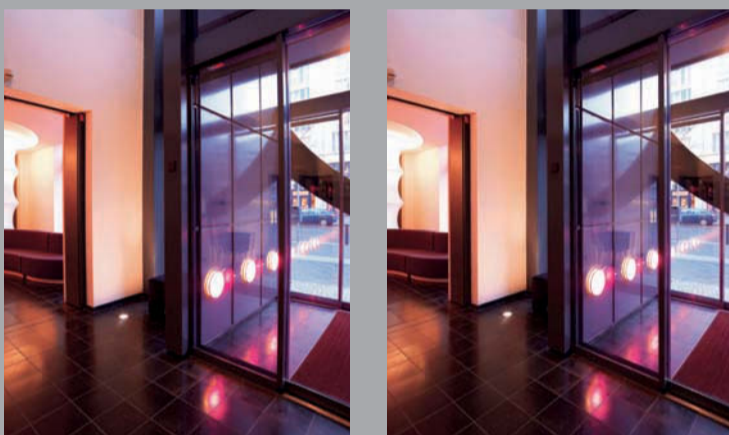
## HCD 4/28 – AT A GLANCE

### 1 LENS DESIGN

The optical design of the HCD 4/28 is based on the HC 3.5/35 and consists of 12 lenses in 9 groups. The fact that a slightly higher distortion was accepted (which can easily be removed digitally) has resulted in an unusually compact design for this super-wide angle lens



### 2 DIGITAL DISTORTION CORRECTION



By allowing the HCD 4/28 a slightly higher distortion, Hasselblad was able to concentrate on the correction of chromatic aberrations and excellent detail reproduction up to the shortest

distance settings. When uncorrected, the distortion of the lens is visible (left), but this effect is totally removed by the Digital Auto Correction integrated in the FlexColor software (right)

Hasselblad's HCD 4/28 is born from a pragmatic approach. Surely they could have developed a 28mm lens capable of dealing with the larger image circle of film; indeed, all optical characteristics could have been carried through within satisfactory parameters – even without the digital boost. Having said that, the vast majority of H camera owners has jumped onto the digital bandwagon and would no longer appreciate the effort it would take to concoct such a design. An alternative could have been a large and heavy lens with a bulging front element, a proud price tag and still no absolute, aberration-free guarantee.

### WIDE-ANGLE PHOTOGRAPHY WITH THE H3D-31

Hasselblad were probably thinking of H3D-31 owners when the 28mm was designed, as it overcomes the obstacle of the smaller sensor with a bona fide wide-angle. In relation to the larger sensors of the other H3D models, the H3D-31 yields a 1.2 lens factor, or, in relation to film, a 1.3 lens factor. The 28mm lens therefore has a focal length the equivalent of a 36mm lens with an angle of view measuring 89 degrees. This way, purchasers of an H3D-31 also have the chance to dabble in wide-angle photography. Mounted on a H3D-22

or -39, however, the angle of view expands perceptibly. This is where the new HCD 4/28 lens really comes into its own.

From an outsider's point of view, it could look as though Hasselblad's developers were trying to circumvent the blemishes of their lenses by patching them up with digital band-aids. This couldn't be further from the truth. The choice to embark upon technologically unfamiliar territory was a conscious one. The promise of a fully integrated digital camera system, in which the numerous components – from lens via camera to digital back – are provided by one company, is now being exploited for the first time ever. The approach is unprecedented amongst digital system cameras, even outside of medium format. All resources were utilized to generate the best picture possible. In the end, the images featured in this spread will abolish any lingering doubt in the HCD 4/28's ability to lay down a stunning result.

What's truly great about the HCD 4/28 is that it allows you to forget the technological effort that went into its development, facilitating the same natural and creative handling as all other HC lenses. Its expansive angle of view will capture the vastness of a lush landscape and also provide a generous perspective in architectural photography. Indoors it will enable you to expose a broad

**Indoors, the short focal length of the HCD 4/28 can create a feeling of depth. The lens reproduces detail homogeneously from the center to the corners of the picture**



**Thanks to Digital Auto Correction (DAC) the HCD 4/28 keeps distortion to a minimum, generating crisp detail at every range (left)**

view in a very tight space. The lens's optical performance remains excellent at close range and enables you to exaggerate the perspective of an object placed only 10 centimeters from the front lens element – no extension tubes needed. In other words: the HCD 4/28 finally takes the H system into extreme wide-angle dimensions, producing the excellent reproduction qualities of the H3D models in a photographic discipline that, once upon a time, obliged turning to far inferior camera systems.

**Photos:** Jürgen Holzenleuchter  
**Location:** Hotel Ku'Damm 101, Berlin  
[www.kudamm101.com](http://www.kudamm101.com)



