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The Schneider News

Dear Business Partners,

We welcome you to read the first Schneider News. We hope that this newsletter helps you to stay updated with our corporate developments, with new product releases, upcoming trade shows and give some information about the latest application examples. We intend to send this newsletter more or less regularly, depending on the news to announce. Please feel free to give us feedback what you would like to see in this newsletter in future.

Best regards

Your Schneider Team

We appreciate any input to be covered within one of the next issues.

In general, the business looks fine. SCHNEIDER-KREUZNACH total sales grew from 2005 to 2006 by 17% and specifically the business unit Industrial Optics grew by 36%. We would like to thank you for your contribution to these results. Please let us know if we can do anything better to support your business because your success will be our success.

Company News

In order to better support the business in Asia, SCHNEIDER-KREUZNACH has opened an office in Korea. Schneider Bando Ltd. is located in Seoul and will currently focus on our photographic business. The involvement in our industrial business is not yet defined. However, we will explore opportunities to use the local presence for improved support also for our industrial business in the future.

Product News

SCHNEIDER-KREUZNACH introduces a new version of a high-resolution line scan lens

We have introduced a 90mm f4.5 lens to our line of high-resolution line scan lenses. Along with our previously introduced Makro-Symmar lenses, the new Apo-Componon lens CPN 4.5/90, extends to five the leading-edge line of our lenses for next-generation camera systems. The CPN 4.5/90 lens has been designed for a magnification ratio from 0.2x to 0.4x.

The focal length of our new Apo-Componon 90mm lens reduces required working distance, which decreases the space required for the camera-lens assembly. This lens allows system designers to make their machines both smaller and more stable, because shorter distance optical assemblies are less sensitive to vibrations and temperature drift.

At f4.5, the lens speed helps to increase image brightness and reduces system costs associated with illumination assemblies.

Like all our ultra-high resolution 12k Line Scan lenses the new 90mm lens features our unique iris locking mechanism and robust design to ensure extremely reliable and precise measurements in even the harshest high vibration manufacturing environments. To optimize lens performance to highest possible level, all our 12k Line Scan lenses

come with the position of “best average azimuth” marked right on the lens body. System manufacturers can compensate for all residual asymmetric tolerances by using this mark to align the lens with the line sensor.

Each of our 12k Line Scan lenses features image circles of up to 90mm and is designed for 5 micron pixel size cameras having up to a 62mm sensor. The large image circle and the low distortion of these lenses enable users to utilize the newest 8k and 12k cameras to improve productivity in surface and web inspection processes. The five lenses now in this line offer a magnification ratio range from 0.2X to 2.0X by using the lens either in standard or retro position.

http://www.schneiderkreuznach.com/pdf/industrie/high_resolution_line_scan_12k.pdf



Tele-Xenar 2.2/70 now available as Compact C-Mount lens

Our family of Compact C-mount lenses has been completed by a version with 70mm focal length.

Compact C-Mount and Macro lenses are available with fixed iris on request

In many cases, the appropriate iris opening is tested at the beginning of vision system development. This iris setting will then always be used and not changed from measurement to measurement. To save cost, we offer for all versions of our Compact C-mount and Macro lenses an OEM version in a cylinder mount with the iris fixed at the desired f-number.

New bandpass filter in the NIR at 855 nm

Our line of interference filters has been completed by a new bandpass filter for 855 nm with a bandwidth of 70nm. As all the other interference filters, this new filter will be available as filter glass in all sizes or in all our standard mount sizes to go on all common lens types.

http://www.schneiderkreuznach.com/industrial_filters/interferenz_filters.htm

New anti-reflection coating for the NIR 550 nm – 960 nm

Several industrial machine vision applications use wavelengths in the near infrared. For industrial filters we can provide on request a special multilayer anti-reflection coating for the wavelength range 550 nm to 960 nm

Please find all our news on our web:

<http://www.schneiderkreuznach.com/presse/presse.htm>

Discontinued products

The following Bayonet to V-mount adapters are obsolete:

Canon, Contax/Yashica, Leica, Minolta AF and MD, Rollei, Olympus, Pentax K

Old versions of Compact C-mount lenses have been fully replaced

Following the recent introduction of SCHNEIDER-KREUZNACH industrial filters for machine vision applications, the design of SCHNEIDER-KREUZNACH Xenoplan and Cinegon Compact C-mount lenses has been upgraded to include built-in accessory threads M30.5x0.5 that simplify filter mounting. Additional lens features include a new enhanced-precision iris (with our popular locking mechanism) that improves control of grey-scale calibration. Because of design reasons, the direction of the iris setting had to be reversed.

There is no change in optical performance as the optical design has not been affected. All modifications refer to the mechanics of the lenses.

Old version:

Lens	Type	Art.-Nr.
Cinegon 1.8 / 4.8	-0512	17528
Cinegon 1.4 / 8	-0512	41823
Cinegon 1.4 / 12	-0515	22892
Xenoplan 1.4 / 17	-0513	41831
Xenoplan 1.4 / 23	-0512	41835
Xenoplan 1.9 / 35	-0511	41877
Xenoplan 2,0 / 28	-0511	17224
Xenoplan 2.8 / 50	-0511	40122

New version:

Lens	Type	Art.-Nr.
Cinegon 1.8 / 4.8	-0902	1001955 *
Cinegon 1.4 / 8	-0902	1001919
Cinegon 1.4 / 12	-0906	1001951
Xenoplan 1.4 / 17	-0903	1001957
Xenoplan 1.4 / 23	-0902	1001917
Xenoplan 1.9 / 35	-0901	1001960
Xenoplan 2,0 / 28	-0901	1001972
Xenoplan 2.8 / 50	-0902	1001976

* still requires filter holder #14604

The mechanical dimensions are available on our web:

www.schneiderkreuznach.com/industrialoptics

Availability/lead time:

The Makro-Symmar 5.6/120 is now available again within short lead time

Last year, with our high resolution line scan lens Makro-Symmar 5.6/120 we won several major investments which led to a much higher order level than planned. Unfortunately, we could not manage to increase production capacity as fast as the orders came in, so that the lead time went up which caused some bottlenecks in availability. Finally, we have overcome this unpleasant situation and the lead time for the SR 5.6/120 is now back again to a few weeks for medium quantities. Small quantities can presently be shipped from stock.

Polarizing filters in new lockable mount now available for major sizes

We have recently introduced a new rotating mount for our industrial polarizing filters. The new mount type "SN2" can be fixed at the desired orientation of the polarizing axis. There is no need any more to use temporary means to fix the position which is not very stable in industrial environments where vibrations are present. The other alternative up to now was to fix the rotating mount with glue, which was irreversible. All these problems are gone when using our new SN2 mount, which is now available for all major sizes.

New Price List

Last year, we kept all prices stable, although operational cost as well as raw material cost increased. This year, we will implement a new price strategy that shall be easier for you to understand. For some product families, such as our Componon lenses, you currently have individual net prices that reflect your conditions depended on your sales volume. The current structure of our Compact C-mount lenses, working with a list price and individual discounts, will be applied for all product groups. The new price list, effective from May 1st, will show for all products a list price. We will provide the new price list during March and you

will get from your key account manager your individual discount rates for the different product families. We have managed to keep the average net price increase to a minimum of a few percent.

Events

Do not miss the opportunity to meet us at the next trade shows:

China Int'l Machine Vision Exhibition in Shanghai on March 22-24, booth no 005

SPIE Defense and Security in Orlando, FL, USA on April 10-12, booth 1649

Finetech Japan in Tokyo on April 11-13, hall 5 booth 24-27e (on the German Pavilion)

Int'l Robots & Vision Show in Rosemont, IL, USA on June 12-14, booth 528

LASER in Munich, Germany on June 18-21

FPD Taiwan in Taipei on July 4-6

Please see the full list of trade shows on our web:
<http://www.schneiderkreuznach.com/messe/messe.htm>

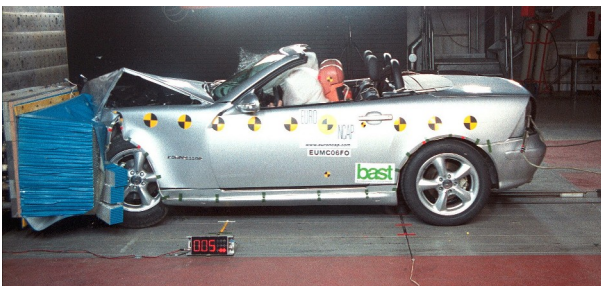
Applications

Lenses for machine vision in the automotive industry

The largest segment in the European machine vision market is the automotive industry with a share of 22%. The global and dominant car manufacturers must follow the pressure of international competition and thus employ continuous cost reduction and process optimizations at equal or even improved quality standards. Exactly these requirements are addressed by modern machine vision systems. There are several applications that demand different requirements in respect to the vision components.

Lenses for crash tests

The safety of cars has been developed over years and still continuous to improve. The crash process is investigated carefully to learn further details of the car's behavior. The crash is analyzed with special high speed cameras.



Analysis of a crash by a vision system

If the camera is installed in the driver's cabin it is exposed by extreme conditions. The high acceleration forces damage or even break sensitive standard components such as the lens on the camera. Usual C-mount lenses as used in typical static vision systems can not endure such strong forces. Because of cost reasons the optics of simple standard lenses are often mounted in a plastic body that does not withstand the occurring forces. Glue improves partially the stability, however, if fixtures of the lens elements inside break the lens elements shift from their correct position. A displacement of

only a few micrometers has an influence on the imaging performance. If the original position tolerances, which were defined in the lens' design, exceed a certain value then the quality of the image on the camera will be dramatically reduced. Because of these reasons rigid lenses in metal housings shall be used. The elements of these lenses shall be specially secured after assembly to avoid the elements breaking loose as a result of impact. The focus and iris mechanism shall be fixed reliably to ensure a good image quality during the crash. Our Compact C-mount lenses feature a robust locking mechanism that allows you to fix iris and focus without backlash.

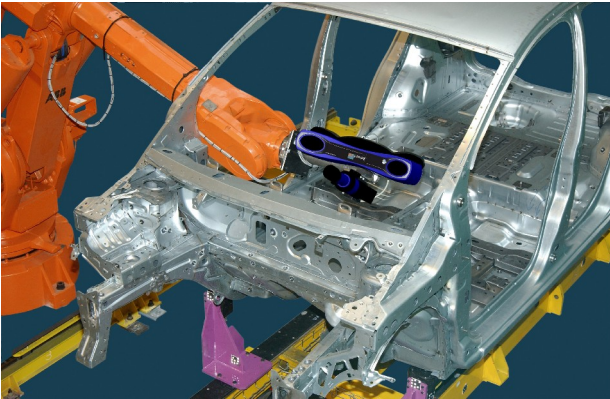


Robust Compact C-mount lenses

Lenses on robots

Because of cost and efficiency reasons the production processes in the automotive industry are automated to a very high level which requires the use of robots in most cases. The guidance of a robot for example for an assembly process is often realized with a vision system. For the assembly with glue, the guidance of the glue dispenser as well as the inspection is commonly done with a vision system. The weld joint of weld processes is checked with an appropriate inspection system. The movements of a robot generate usually high g-forces. Such highly automated production lines run usually 24/7 and each interrupt of the process is a disaster because it decreases productivity and each minute standstill creates huge cost. The reliability of the components becomes a crucial factor in the

choosing process. A saving at the lens is usually not recommended in trade off for an increase failure risk by mechanical instability.



Lenses in a vision system on a robot

Lenses for 3D metrology and digitizing

The acquisition of the 3-dimensional shape of parts also plays an important role in the automotive industry. Depending on the task there are different methods. A common technique for example is stripe projection. Similar to the human eyes there are two stereo cameras looking under different angle at the stripes projected onto the object. The data will lead to a 3-dimensional image in the computer. The lenses which project the stripes onto the object must satisfy different requirements than the lenses used to image the stripes onto the sensor inside the cameras. The projection units use strong light sources so that the projection lens must be designed for high optical power levels. To adjust the brightness of the light, specifically the iris must be resistant against a high intensity and the high temperatures induced. If white light is used for projection, the lens must feature a good correction of the chromatic aberrations. A simple chromatic correction as used for standard lenses leads to color fringes in the projected stripes which decrease the measurement accuracy of the system. The imaging optics also affects the overall measurement accuracy. These lenses shall feature a small distortion, for high accuracy systems the residual distortion is calibrated out. A low contrast of small structures limits the resolution of the image on the sensor. The MTF (modulation transfer function) specification of the lens can be used to assess the achievable contrast of the image. The

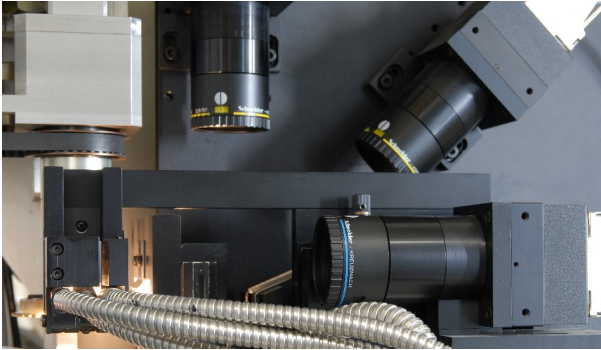
MTF data of a lens shall in any case be checked within the selection process to avoid limitations of the overall system performance afterwards. The MTF requirements for the lens depends on the individual system parameters. The pixel size of the sensor in the CCD camera defines the Nyquist frequency – that is the maximum achievable resolution. The specifications for the lens MTF is then derived from the Nyquist frequency, the sensor size, the optical magnification ratio and the aperture.



Lenses in a 3D measurement system

Lenses for the inspection of parts

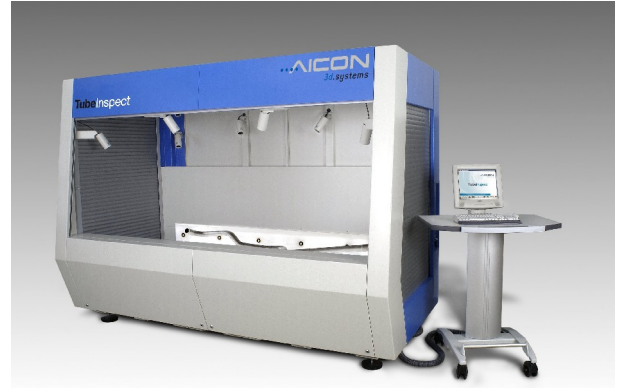
The quality assurance in serial production processes of parts is commonly realized with optical inspection technology. The system with a digital camera and appropriate lenses must be designed for the individual requirements. To test for example synchrony rings for cars there are several parameters to be checked such as completeness, shape deviations, irregularities, diameter and height. Tolerances are measured down to 0.1mm. By optical inspection defects such as pressure marks or unmachined cylinder surfaces are detected. This requires high optical resolution lenses.



Lenses in a part inspection system

For high precision measurements of symmetrical parts in the pre-production of car manufacturing special telecentric lenses are used that avoid changes of the geometric measurements in the x-y plane when shifted in the z-plane. The use of such telecentric lenses together with high resolution cameras and the appropriate software allows measurement accuracies for diameter, length and shape in the range of micrometers.

Brake pipes and exhaust pipes are precisely measured for quality assurance using optical measurement systems. Machines with several static high-resolution CCD cameras capture the shape of the pipe with an accuracy up to +/- 0.1 mm.



Lenses in a tube measurement system

Conclusion:

These examples demonstrate that the selection process of an appropriate lens for a vision system in the automotive industry depends on several factors. The optics is a crucial component that strongly contributes to the quality of the overall system. We recommend the system engineer to contact us at the beginning of a development project to discuss with us the suitable lens for his individual requirements. We help the system integrators and equipment manufacturers to improve their vision system and to avoid disappointments after system assembly.

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