FROM ZEISS DELTRINTEM 8X30 TO ZEISS VICTORY SF 8X32, SWAROVSKI NL Pure 8x32, GPO PASSION ED 8x32 AND KOWA 8x32 BD-II

Dr. Gijs van Ginkel

June 2021

INTRODUCTION.

- ***1920-2020 Hundred years of 8x30/8x32 binocular production.***

The year 2020 is a memorial year, since according to the data I could find it was in that year 100 years ago that serial production of 8x30 binoculars was introduced by both Hensoldt, Wetzlar and Zeiss, Jena. That were successively: **(a)** the Hensoldt 8x32 roof prism Dialyt (N.B. 1920 was only a few years before 1928, the year in which Hensoldt was taken over by Zeiss: a very clever decision by Zeiss since it acquired all know-how and experience of Hensoldt with roof prisms). **(b)** The Zeiss Deltrentis/Deltrintem, a binocular with porro prisms, weight 702 grams (in 1928 weight was reduced). In 1990 after 70 years the production of the Deltrentis/Deltrintem 8x30 was stopped.

AIM OF THIS REPORT

This report aims at an (incomplete) overview of the production of 8x30/32 binoculars in the time period 1920-2020.Moreover we will investigate the performance of the new Swarovski NL Pure 8x32, the Zeiss Victory SF 8x32, the GPO Passion ED 8x32 and the Kowa 8x32 BD II binoculars.

Also, the optical performance of the Leica Geovid 8x42 HD-B rangefinder is investigated in comparison with other 42 mm rangefinders, see table 8 and its transmission spectra.

Picture 1. *Top Zeiss Deltrintem 8x30, below from left to right Swarovski NL Pure 8x32 and Zeiss Victory SF 8x32.*

Picture 2. *Top Hensoldt Dialyt 8x32 (1955), below from left to right Swarovski NL Pure 8x32 and Zeiss Victory SF 8x32*

Growing popularity and new designs.

From 1920 on 8x30/8x32 binoculars became increasingly popular and in the years 1950-1980 they were often referred to as excellent binoculars for general use: compact, easy to handle, not so heavy and with sufficient light gathering properties in a lot of different conditions.
In 2020 Zeiss Wetzlar/Oberkochen introduced a remarkable 8x32 binocular: the Zeiss Victory SF 8x32. It is different with respect to body design as well as with regard to optical design. The SF 8x32 has Schmidt-Pechan roof prims and a so-called open bridge body structure, a design Swarovski introduced around the year 2000 with its popular series of EL binoculars.
In 2020 Swarovski, Austria introduced a new series of binoculars: the NL Pure range that next to 42 mm models also contains two new 32 mm binocular: the NL Pure 8x32 and 10x32. They are completely different and newly designed 8x32 roof prism binoculars as successors of or addition to the popular open bridge EL binoculars and little sisters of the earlier introduced 42 mm NL Pure binoculars. The Swarovski NL Pure binoculars have a rather different new body design, that by some users is considered a revolution for optimal handling properties due to its ergonomic design. Moreover, Swarovski succeeded to enhance the optical quality quite a bit as we hope to show later.

This report is written to investigate the optical performance and handling properties of

(a) the new Swarovski NL Pure 8x32 in comparison with the Zeiss Victory SF 8x32. The test report of the Zeiss Victory SF 8x32 was published earlier (2020) on the WEB-site of House of Outdoor.

(b) Since not everybody can afford the prices of the new Swarovski and Zeiss 32 mm binoculars, we also investigated two other binoculars in a lower price range: **the GPO Passion ED 8x32 and the Kowa 8x32 BD-II.**

An incomplete overview of 100 years 8x30/8x32 is sketched in pictures and tables 1-3-below. I do not pretend that this overview is complete, but it supplies data I have found in different sources and they show the large number of 8x30/32 binoculars produced in that time period. To make the reader of this report happy I have left a lot of open spaces in the tables, so everybody can search for additional data and supply them to the binocular community if you like the idea.

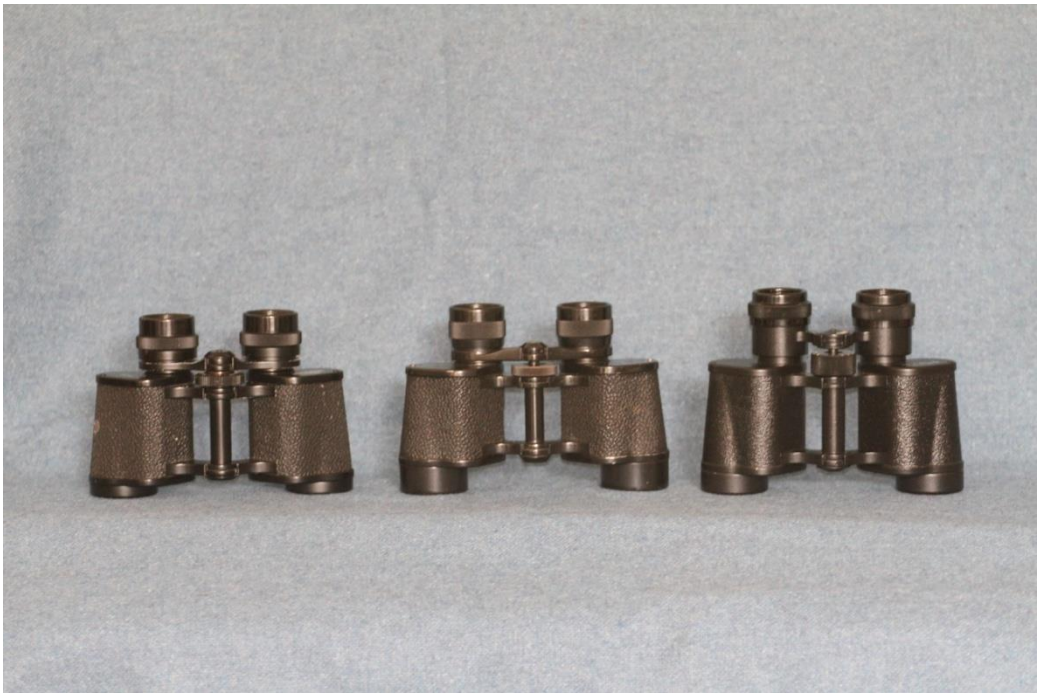
Picture 3. *From left to right: Zeiss Victory SF 8x32, GPO Passion ED 8x32, Kite Lynx 8x30, Swarovski NL Pure 8x32*

Picture 4. *Leitz Trinovid 1 (1963) 8x32, Leica Trinovid 8x32 BN, Leica Ultravid HD-plus 8x32*

Picture 5. *From left to right: Hensoldt Dialyt 8x32 (1955), Zeiss Dialyt 8x30 model 1(1964-1969), Zeiss Dialyt 8x30 model 2 (1969-), Zeiss Conquest Mark 1 8x30 (made by Zeiss-Hungary), Zeiss Victory SF 8x32.*

Picture 6. *From left to right: Kite Petrel 8x32, Docter 8x32*

Picture 7. *From left to right: Hensoldt Dialyt 8x32, Hensoldt Diagon 8x30, Hensoldt Diarex 8x32, Hensoldt Military 8x30 GA.*



Picture 8. *From left to right: Hertel & Reuss 8x30, Nitske 8x30, Russian 8x30.*

Picture 9. *From left to right Hensoldt Dialyt 8x32, Zeiss Victory SF 8x32 and Swarovski NL Pure 8x32*

Picture 10. *From left to right: Swarovski NL Pure 8x32, GPO Passion ED 8x32, Kowa 8x32 BD-II*

Picture 11. *From left to right Zeiss Victory SF 8x32, GPO Passion ED 8x32 and Swarovski NL Pure 8x32*

Picture 12. *From left to right: two hundred years 8x30 in one picture: Zeiss Deltrintem 8x30, Zeiss Victory SF 8x32 and Swarovski NL Pure 8x32*

Picture 13. *From left to right: Zeiss Victory SF 8x32,* ***Leica Geovid 8x42 HD-B (N.B. we have also investigated this binocular in this report although it is not an 8x30/32****, Swarovski NL Pure 8x32*

Picture 14. *From left to right Leitz Trinovid 1 (1963), Leica Geovid 8x42 HD-B.*

Picture 15. *From left to right: Kern 8x30, Kern 8x30 GA, Kern 8x30 CF civilan, Leica-Kern 8x30*

Picture 16. *From left to right: Swarovski Habicht 8x30, Swarovski SLC 8X30*

Picture 17. *From left to right: Zeiss Dialyt GA 8x30, Nikon 8x30 GA, Hensoldt military 8x30 GA, Swarovski Habicht 8x30 GA*

TEST RESULTS.

The data obtained from different measurements are listed in tables 5-8 and the transmission spectra are all listed at the end of the paper. Apart from the transmission graphs of the Swarovski NL Pure 8x32, the Zeiss Victory SF 8x32, GPO Passion ED 8x32 and the Kowa 8x32 BD II we have also listed a number of transmission spectra from 8x30/32 models which may be of interest for the reader, but they can also be useful as comparative information.

N.B. The test of the Leica Geovid 8x42 HD-B rangefinder does not fit into this 8x30/32 test, but I have nevertheless chosen to publish it here in comparison with data from other rangefinders published before, see Table 8 and its transmission spectrum. From these data the reader him/herself can draw his/her own conclusions.

-1- THE SWAROVSKI NL PURE 8X32

The text I have written about the Swarovski NL Pure 8x42 is fully valid also for its little sister: the Swarovski NL Pure 8x32 and I will repeat it here as far as it applies to the 32 mm model. The specifications of the NL Pure are listed in Table 4 in comparison with some other 8x32 binoculars. The Swarovski NL Pure 8x32 is an excellent instrument with a high level of user comfort due to a well-balanced body design and a smoothly turning focusing wheel that needs 1,8 turns from close focus to infinity. Users with very big hands may perhaps have a different feeling, so try before you buy. The measured close focus distance for the NL Pure was 1,9 m versus 1,84 m for the Zeiss Victory SF 8x32; the NL Pure is almost 70 grams heavier than the SF 8x32. Eye-relief of the 32 mm NL Pure is 18 mm versus 19 mm for the SF 8x32, a very small difference. The Swarovski NL Pure has well-made metal eyecups (the SF has plastic eyecups) with 6 intermediate stops enough choice for many customers. The eyecups are connected with a screw mount, so cleaning or replacing is easy and can be done by the owner him/herself. The turning resistance of the focusing is exactly right and it does not move unwanted.

The objective covers are attached to the body and can be easily clicked on or taken of. However, quite a few customers had the experience that the objective caps made their own choice, not wanted by the owner: they drop of. That is a weak point of this design, but if you look into binocular history: objective caps came rather late into the picture simply since they did not seem functional for the operation of the binoculars. The first thing I generally do is: take the objective covers of and never put them on again.

The Swarovski new attachment system for the body strap is meant to prevent the strap from getting twisted. The connection system protrudes from the binocular body and contains a bayonet connector with a spring inside to prevent the connector pin to come loose. In the beginning the system had some birth problems resulting in the surprising event that the binocular would go its own way, not planned by the owner. At present these birth problems seem to be cured. But if you do not want this specific Swarovski NL strap, you can also use standard straps by connecting the adapters Swarovski has designed for that purpose. These adapters are also connected to the binocular body with the stainless-steel bayonet pins Swarovski supplies (N.B. there are different pins available with different length).

Now everything is ready to use the NL Pure 8x32 and, just as with her larger sister it is an overwhelming surprise for the following reasons:

Handling is excellent due to the ergonomic body design: for most hands the NL Pure feel as if they were made for them, only very big or very small hands need to check if that is also valid for them.

The NL Pure image is often for customers kind of impressive: a crystal clear and very bright image with a large field of view of 150m/1000m (that in itself is not new if you look at the different

8x30/32 binoculars in tables 1-3). The colors of the NL Pure are exactly right, the reason is directly clear from the measured transmission spectra; a high light transmission (92-93% over a wide wavelength range for the NL Pure 8x32) and 2-3% lower for the Zeiss Victory SF 8x32. Moreover, the transmission spectrum of the NL Pure is almost flat over a wide wave length range and that is not the case for the SF 8x32. So strictly according this criterium the NL Pure has better color reproduction/fidelity then the Zeiss Victory SF 32. This will of course generate many and fierce discussions, but that is how binocular producers themselves judge color reproduction of their binoculars using the applicable DIN standards for this matter.

2- THE ZEISS VICTORY SF 8X32 COMPARED WITH THE WAROVSKI 8X32 EL -SV AND THE SWAROVSKI NL Pure 8x32

The properties and performance of the Zeiss Victory SF 8x32 have been discussed before in my test report of the Swarovski NL Pure 8x42 (see the WEB-site of House of Outdoor).

The SF 32 has a well-designed and attractive body shape comparable with the Swarovski 8x32 EL-SV and it is roughly one cm longer then the EL-SV. The body cover consists of black colored hard rubber that feels good in the hands. The eyecups of the 32 mm Zeiss SF and the Swarovski EL-SV can be turned in and out in three steps, so users of spectacles can make a choice for the optimal position. Both binoculars have 19 mm eye relief, sufficient for most spectacle users. The Victory SF has plastic eyecups, whereas Swarovski uses metal ones. Both are supplied with a screw mount, so they can be removed by the user for cleaning or replacement. The rubber of the Victory SF eyecups is soft, whereas that of the EL-SV (and the NL Pure) is harder.

The space of the SF open bridge is 5 cm long and 5,5 cm for the Swarovski EL-SV. That is not a lot of difference but it can play a role in the handling of the binocular. With my hands there is room for only two fingers in the open space of the Victory SF bridge, leaving my middle finger just under the focusing wheel of the SF over the bridge and the index finger can then be used for focusing. With the EL-SV the open space accommodates my three fingers, so my index finger can be used for focusing. That situation is of course different for different hand sizes, so you better find out yourself. Both binoculars work fine for me.

The turning resistance of both focusing wheels feels similar to me, but there is a difference in the mechanism to correct for the strength between the two eyes. The Zeiss SF has a small wheel on top of the central axis. That has to be pulled out to turn it for adjusting to the difference in eye strength (and then pushed back of course to lock it). That works fine. To make these adjustments with the EL- SV one has to lift the focusing wheel, turn it to the desired position and push it back so it is locked. That works also fine. (Since 1999 a whole generation of Swarovski users is familiar with this mechanism).
The EL- SV is a tiny bit lighter than the Victory SF, but that will hardly be noticed probably. With the SF-42 one can really feel the shift in weight distribution towards the eyepieces, I could not feel that with the Victory SF 32. For me handling comfort of the ELSV 8x32 is a little better than that of the Zeiss Victory SF 8x32, but that will undoubtedly differ for different hand sizes.

As far as optical performance is concerned: most obvious is the difference in Field of View: 155m/1000m for the 32 mm Victory SF and 141m/1000m for the 32 mm EL-SV. Striking is the thin blue line at the outer field of view of the Victory SF, I also noticed that with the Victory SF 8x42. It did not bother me and it does not affect the overall observation pleasure for me.

If we now compare the Zeiss 8x32 Victory SF with the Swarovski NL Pure 8x32 the situation is a little different. The design of both binoculars as far as body structure is concerned is very different. For my hands the NL Pure 8x32 beats the Zeiss Victory SF with regard to handling performance, because of its body design and ease of use of the focusing wheel, but that can differ dependent on the size and shape of your hands, so try before you buy. Other parameters of the Zeiss Victory SF 8x32 and the Swarovski NL Pure 8x32 are also not the same as can be seen in table 4.
The Zeiss Victory SF 8x32 has a weight of 603 g, an FOV of 155m/1000m and a close focus distance of 1,84 m, whereas the Swarovski NL Pure weighs 672 g, has an FOV of 150m/1000m and a close focus distance of 1,9 m. The price of both binoculars has almost the same pale making level of 2400 euros or a little less.
The Swarovski NL Pure 8x32 beats as far as I am concerned the Zeiss Victory SF 8x32 with its level of handling comfort, higher light transmission and better color reproduction.
Zeiss supplies a very plain black colored bag with the Victory SF that fits tight over the binocular. It is well made, but it looks rather plain for a binocular in this price range. Looking at different light sources from intense point sources to broader shining light sources I could not detect any sign of glare or internal reflections in the Swarovski NL pure or in the Zeiss Victory SF although some users report this phenomenon in the NL Pure.

-3- GPO Passion 8x32ED.

GPO stands for German Precision Optics, a company that came into life by the initiative of two men who came from a high rank position in the Zeiss organization, so they know very well how binoculars work. GPO has a very large production program: binoculars, laser rangefinders, riflescopes etc.
The GPO Passion 8x32ED investigated here is one of their products. These binoculars have the shape and size of quite a few other lower priced binoculars made in China like Kite, Maven, Nikon etc. However, GPO has made their 8x32 very attractive by supplying them in different body armor color. The body armor covers part of the binocular body (the remaining part is black metal)and an be obtained in the colors black, brown, sand, green. I have investigated the brown colored one, which to my taste looks very elegant, but, more important, it feels fine. The technical data we have found are listed in Table 5. Striking is their weight of 520 g and fast focusing with 1,2 revolutions from close focus of 1,7 m to infinity.
The FOV of 139 m/1000m is of course quite a bit smaller than the Swarovski and Zeiss binoculars discussed above, but the price difference is about a factor 6 lower! We measured an eye relief of 13 mm, but the GPO flyer lists 16 mm. It takes 1,2 revolutions of the large and smoothly working focusing wheel from close focus to infinity, a fairly fast and rather pleasant focusing speed. We measured transmissions ranging from 88 % at 500 nm to 90,2% at 500 nm while the transmission spectrum is fairly flat over a broad wavelength range, the basis for the good color reproduction. The binoculars come with an instruction manual, cleaning cloth, hard case, neoprene neck strap, hard case strap, objective covers and ocular covers.
In my opinion this binocular is worth every penny of its price of 380 euros because of its high-performance at this price level.

-4- Kowa 8X32 BDII.

The metal body of the 8x32 Kowa is exactly identical to that of the Kowa 6,5x35 and is also covered with green hard rubber, which feels fine. The Kowa 8x32 has the same body characteristics as the 6,5x35: the strap connection rings are located in such a position that the risk exists that they

are located in the mouse of the hands and that is rather painful and annoying, but with proper adaptation the painful effects can be decreased or avoided. With big hands this can however be a difficult to solve problem, so try before you buy, since it can affect your pleasure badly.
The binocular is shorter and looks more bulky-compact than the 32 mm GPO, see Picture 10. Besides the difference in size between the 32 mm Kowa and the 32 mm GPO there are other differences, see table 5. Most remarkable for the differences between the 32 mm GPO and the 32 mm Kowa is the large FOV of 154m/1000m, short measured eye relief of 10 mm, close focus of 1,1 m and a significant lower light transmission (85,7 to 84,2%) and a higher price 429 euros of the Kowa.

It depends of course on your demands which binocular would be your choice so again: try before you buy, since technical specifications is one thing, but user demands and user comfort/taste is another matter, but for me the choice fell on the GPO Passion ED 8x32.

CONCLUSIONS.

-1- The Swarovski NL Pure 8x32 and the Zeiss Victory SF 8x32 are both excellent binoculars. My personal choice after trying over and over would be the Swarovski NL Pure because of its superior handling comfort in combination with its excellent optical performance. Moreover, Swarovski offers an almost unparalleled service level.

-2- The Zeiss Victory SF 8x32 is also a very good binocular, but for my hands handling was sometimes problematic. The optical quality with its wide field of view is very attractive, the blue ring at the outer field of view is peculiar, but does not affect the image pleasure of the binocular.

-3- The GPO Passion ED 8x32 is a nice binocular to look at with its colored body cover, but more important it is also a fine binocular with its low weight, excellent handling comfort, high light transmission and very good color reproduction at an attractive price level.

-4- The Kowa 8x32 BD II is a good binocular for its price. The binocular has a large FOV, a short close focus distance, but a very short eye relief that can yield difficulties for eyeglass users. Big hands may suffer from the position of the strap rings. Color reproduction is a tiny bit lower than that of the GPO Passion, but the majority of users will not notice that probably. The price of 429 euros is attractive.

Acknowledgments: *I am grateful to Ing. Dave van den Heuvel for all his efforts to measure the transmission spectra and to Jan van Daalen of House of Outdoor & Optics to supply me with different binoculars for this investigation.*

TABLE 1

An incomplete overview of 100 years of 8x30/8x32 binocular production.

Binocular brand	Weight (g)	FOV (m/1000m)	Close focus	Daylight transmission	Year of introduction
Aus Jena/ Docter 8x32B, roof	660g	130m/1000m			
Bushnell 8x32	400g 596 g	127m/1000m 122m/1000m			
Hartmann Compact 8x30 WW, porro	610 g	150m/1000m			
Hartmann Porlerim 8x30, porro Hartmann Porlerim 8x30 WW, porro	560g 570 g	135m/1000m 150m/1000m			
Beck Zenith 8x30 porro	430 g	150m/1000m			
Beck Avvis 8x30W porro	450 g	145m/1000m			
Beck Mare 8x32 porro	485 g	135m/1000m			
Beck Stern 8x30 and 8x32, porro					
Beck Merkur 8x30, porro					
Beck Diorit 8x30 roof	430 g	130m/1000m			
Hertel und Reuss 8x30 N, porro	510 g	135m/1000m			
Hertel und Reuss 8x30 WW, porro	450 g	157m/1000m			
Hertel und Reuss 8x30 GF, porro	450 g	132m/1000m			
Hertel und Reuss 8x30 Lord, porro	550 g	157m/1000m			
Hertel und Reuss 8x30, porro	450 g	120m/1000m			
Barr & Stroud 8x30,5, porro	230 g	127m/1000m			
Steiner Skyhawk roof 8x32	570 g	112m/1000m			
Steiner Wildlife 8x30	520 g	130m/1000m			
Steiner Safari 8x30 porro	510 g	100m/1000m			
Steiner Jagd/Marine 8x30 porro	960 g	158m/1000m			
Steiner 8x30E, porro	380 g	130m/1000m			
Steiner 8x30 EC porro	510g	130m/1000m			
Steiner 8x30 EC porro	510 g	130m/1000m			
Steiner 8x30 ECA porro	580 g	130g/1000m			
Steiner 8x30 porro	420 g	120m/1000m			
Steiner 8x30 WW, porro	520 g	150m/1000m			
Vanguard Endeavour 8x32 roof	580 g	131m/1000m			
Vanguard Serana 8x32 roof	665 g	131m/1000m			
Vanguard Venture 8x32 roof	600 g	119m/1000m			
Minolta 8x30 porro					
Minolta 8x32 roof	530 g	124m/1000m			
Asahi Pentax 8x30 ZFC porro	510 g	131m/1000m			
Asahi Pentax 8x30 BIF porro	446 g	149m/1000m			
Asahi Pentax 8x30 DCF roof	480 g	123m/1000m			
Nikon 8x32 HG porro	693 g	136m/1000m			
Nikon 8x32 E11 porro	576 g	155m/1000m			
Nikon 8x30 E CF WF porro	580 g	145m/1000m			
Keiner, Wetzlar 8x30 porro	320 g	125m/1000m			
Wöhler Moniet 8x30 porro	520 g	155m/1000m			
Huet Miralux 8x30 porro	450g	155m/1000m			
Huet Trinotix8x30 porro					1928
Huet Mirapan 8x30 porro		200m/1000m			
San Giorgio “MEGA”, 8,5x30, porro					
Hensoldt Stereo Walkar 8x30 porro	430 g	150m/1000m			
Hensoldt Sport Dialyt 8x30 roof	390 g	125 m/1000m			1920?
Hensoldt Diarex 8x30 mirror		120m/1000m			
Goertz Heli-Trieder porro, porro					1922
Canon 8x30 WP roof					
Agfa porro					
Asahi Pentax, porro	490g				

TABLE 2

An incomplete overview of 100 years of 8x30/8x32 binocular production.

Binocular brand	Weight (g)	FOV (m/1000m)	Close focus	Light transmission	Year of introduction
Swarovski Habicht-Merkur, porro	450g	150m/1000m			
Swaroxski Habicht O/M/MGA, porro	490-560 g	123m/1000m			
Swarovski Habicht 8x30W, porro	520-580 g	142 m/1000m			
Swarovski Habicht SLC 8x30 W, roof	540 g	138m/1000m			
Swarovski 8x30 fotomonocular, porro		150m/1000m			
Swarovski 8x30 SLC mark II, roof, 8x30WB	530g	135m/1000m			
Swarovski 8x32 EL WB, roof	580 g	141m/100m	1,9 m		
Swarovski CL Companion 8x30B, roof	500 g	124m/1000m	3 m		
Swarovski Habicht 8x30W, porro	540g	136m/1000m	3 m		
Swarovski EL 8x32 WB, roof	595 g	141m/1000m	1,9m		
Swarovski CL Companion 8x30 B, roof	490 g	132 m/1000m	3m		
Swarovski 8x32 NL pure, roof		150m/1000m	2 m		
Zeiss Victory FL 8x32, roof	552 g	140m/1000m	1,84 m		
Zeiss Victory SF 8x32, roof	603 g	155 m/1000m	1,8 m		
Leitz Trinovid 8x32, roof					1963-1975 B model from 1973
Leitz 8x32 BA roof prism					1992-2001
Leitz 8x32 BN roof prism					
Leica Ultravid HD-plus, roof	531 g	135 m/1000m	2,1 m		
Leitz Bilom and Bilomit porro	450g	150m/1000m			1930-1935
Leitz Binux and Binuxit porro	440 g	150m/1000m			1927-1962
Meopta 8x30 porro					
Meopta B1 8x30 roof prism	588 g	139m/1000m	1,6 m		
Nedinsco, ‘sGravenhage 8x30, porro					1932
Nikon 8x30 porro in Bausch and Lomb housing model					1965
Nikon military (roof prism)	718 g	131 m/1000m			1980
Russian (USSR) 8x30, porro		220m/1000m			1972
Russian Tento porro					
Schuettz, porro					
Zeiss Jena Deltrentis/Deltrintem porro					1920-1990
Zeiss Oberkochen 8x30B, Dialyt roof					1964, long model
Zeiss Oberkochen 8x0B, Dialyt roof					1970, short model
Zeiss Oberkochen, 8x30, porro					1965
Zeiss Conquest (Mark1), Hungary 8x30, roof					
Zeiss Victory FL 8x32, roof	552 g	140m/1000m			
Zeiss Victory SF 8x32, roof	603 g	155m/1000m			2020
Zeiss Terrra 8x32ED, roof					
Ralike 8x30, porro	500g	120m/1000m			
Ralike wide angle 8x30, porro	475 g	135 m/1000m			
Ralike weitwinkel model Wetzlar, 8x30, porro	500 g	150m/1000m			
Ralike model “Zwerg Wetzzlar”, 8x30 porro	320 g	135m/1000m			
Leitz Binux and Binuxit 8x30 porro	440 g	150m/1000m			
Leitz Bilom and Bilomit , 8x30 porro	450 g	150m/1000m			
Russian, BPSh, miltitary, 8x30M, porro		227m/1000m			
Kern military, porro	560g	150m/1000m		83%	
Kern Pizar civilian, porrro	560 g	140m/1000m		79%	

TABLE 3

An incomplete overview of 100 years of 8x30/8x32 binocular production.

Binocular brand	Weight (g)	FOV (m/1000m)	Close focus	Light transmission	Year of introduction
Nitscke Rathenow, porro	362 g				
Hensoldt Diagon porro	449 g	150m/1000m			
Hensoldt Diagon GA militay, porro	697 g	150m/1000m			
Hensoldt Dialyt 8x30, roof	604 g	150m/1000m			
Bausch and Lomb 8x30, porro	703 g				
Nikon 8x30GA, roof	718 g				
Wöhler ATLAS, 8x30 porro	481 g	140m/1000m			
Aus Jena DDR, Notaremm, roof	580g	130m/1000m	3,5m		
Bresser Condor, roof	464g	105m/1000m	5 m		
Bresser Diorit 8x32	450g	131m/1000m	5m		
Bresser Jaguar, 8x32 porro	562g	122m/1000m	7m		
Bresser Linear 8x32, roof	420g	131m/1000m	6m		
Bresser Luchs, 8x32 porro	507g	145m/1000m	5m		
Bresser Speed 8x30 porro	675 g	148m/1000m	6m		
Bresser Swing MC 8x30 porro	464 g	105m/1000m	5m		
Carton Duke 8x32 porro	450g	126m/1000m	3,5m		
Optolyt Alpin 8x30 porro	420 g	135m/1000m	5m		
Krombach @Lust 8x32, porro	508 g		3,7 m		
Krombach 8x30P, porro	500g	120m/1000m			
Krombach 8x30S, porro	320g	120m/1000m			
Krombach 8x30PW. porro	515g	150m/1000m			
Krombach 8x30 Piccolo, porro	320 g				
Enuro Turnier 8x30, porro					

Table 4

Binocular	**Swarovski NL Pure 8x32**	**Zeiss Victory SF 8x32**	**Swarovski EL-SV 8x32 (2012) NB serviced in 2020**	**Zeiss Victory FL 8x32**	**Leica Ultravid HD-plus 8x32 (2016)**	**Meopta Meostar B1 8x32 (2016)**
Weight (g)	672 g	603 g	583 g	552 g	531 g	588 g
Objective diameter (mm)	31,9 mm	31,75 mm	31,6 mm	31,9 mm	32,0 mm	31,9 mm
Exit pupil (mm)	4 mm	3,95 mm	4 mm	4,15 mm	4,0 mm	4,1 mm
Magnification	7,98x	8,03x	7,9x	7,7x	8x	8,1x
Eyerelief (mm)	18 mm	19 mm	19 mm	15,5 mm	13,3 mm	15,5 mm
Field of view (m/1000m)	150m/1000m	155m/1000m	141m/1000m	140m/1000m	135m/1000m	139m/1000m
Close focus (m)	1,9m	1,84 m	1,76 m	1,8 m	2,1 m	1,6 m
Prism type	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof
Diopter range	+/-4 diopt.	+/- 4 diopt.	=/- 4 diopt.	+/- 4 diopt.	+/- 4 diopt.	+/- 3 diopt.
Range between both eyes	55-74 mm	53-75 mm	54-74 mm	53-74 mm	52-74 mm	53-73 m
Rev. CF-∞	1,8	1,75	2	1,5	1,1	1,75
Phase correction coating	Yes	Yes	Yes	Yes	Yes	Yes
Light transmission 500 nm 550 nm	 91,7% 92,8 %	 87% 90%	 91,6% 92,9%	 89% 93%	 86,8% 89,2%	 86,1% 87,6%
Body cover	Green or orange hard rubber	Black hard rubber	Green or beige hard rubber	Black hard rubber	Black hard rubber	Green hard rubber, special edition blue
Color reproduction	Excellent	Good	Good	Good	Very good	Good
Accessories	Bag, strap, eyepiece cover, objective caps, head rest	Bag, strap, eyepiece cover	Bag, strap, eyepiece cover	Bag, strap, eye piece cover	Bag, strap, eyepiece cover	Bag, strap, eyepiece cover, objective caps
Waterproof	Yes	Yes	Yes	Yes	Yes	Yes
Handling comfort	Super	Excellent	Excellent	Good	Good	Very good
Warranty	10 years	10 years	10 years	10 years	10 years	10 years
Price (euro)	2410	2340	1890	2035	1880 (2016)	879 euro (2016)
Final judgment	++++++	+++++	+++++	+++++	+++++	+++++

Table 5

Binocular	**Swarovski NL Pure 8x32**	**Zeiss Victory SF 8x32**	**GPO Passion ED 8x32**	**Kowa 8X32 BD II**	**Leica Ultravid HD-plus 8x32 (2016)**	**Meopta Meostar B1 8x32 (2016)**
Weight (g)	672 g	603 g	520 g	534 g	531 g	588 g
Objective diameter (mm)	31,9 mm	31,75 mm	31,5 mm	31,65 mm	32,0 mm	31,9 mm
Exit pupil (mm)	4 mm	3,95 mm	4,2 mm	4 mm	4,0 mm	4,1 mm
Magnification	7,98x	8,03x	7,5x	7,9x	8x	8,1x
Eyerelief (mm)	18 mm	19 mm	13 mm	10 mm	13,3 mm	15,5 mm
Field of view (m/1000m)	150m/1000m	155m/1000m	139m/1000m	154m/1000m	135m/1000m	139m/1000m
Close focus (m)	1,9m	1,84 m	1,7 m	1,1 m	2,1 m	1,6 m
Prism type	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof
Diopter range	+/-4 diopt.	+/- 4 diopt.	+/- 2,5 diopt.	+/- 3 diopt.	+/- 4 diopt.	+/- 3 diopt.
Range between both eyes	55-74 mm	53-75 mm	55-75 mm	55-76 mm	52-74 mm	53-73 m
Rev. CF-∞	1,8	1,75	1,2	1,3	1,1	1,75
Phase correction coating	Yes	Yes	Yes	Yes	Yes	Yes
Light transmission 500 nm 550 nm	 91,7% 92,8 %	 87% 90%	 88% 90,2%	 85,7% 84,2%	 86,8% 89,2%	 86,1% 87,6%
Body cover	Green or orange hard rubber	Black hard rubber	Partly light brown hard rubber and the rest black metal	Green hard rubber	Black hard rubber	Green hard rubber, special edition blue
Color reproduction	Excellent	Good	Good	Good	Very good	Good
Accessories	Bag, strap, eyepiece cover, objective caps, head rest	Bag, strap, eyepiece cover	Bag, strap, eyepiece cover	Bag, strap, eyepiece cover	Bag, strap, eyepiece cover	Bag, strap, eyepiece cover, objective caps
Waterproof	Yes	Yes	Yes	Yes	Yes	Yes
Handling comfort	Super	Excellent	Very good	Allright, strap lugs can be annoying	Good	Very good
Warranty	10 years	10 years	10 years	10 years	10 years	10 years
Price (euro)	2400	2340	380	429	1880 (2016)	879 euro (2016)
Final judgment	++++++	+++++	+++++	+++++	+++++	+++++

Table 6

Binocular	**Hensoldt Dialyt 8x32**	**Hensoldt 8x30 GA military**	**Leitz Trinovid 8x32 (1963)**	**Leica Trinovid 8x32 BN (2001)**	**Zeiss Dialyt 1 8x30B (1964-1969)**	**Zeiss Dialyt 8x30B SHORT (new model) 1969-**
Weight (g)	604g	667 g	489 g	625 g	632 g	568 g
Objective diameter (mm)	31,8 mm	29,6 mm	31,8 mm	31,9 mm	29,9 mm	29,8 mm
Exit pupil (mm)	4,2mm	3,6 mm	3,8 mm	4,15 mm	3,8 mm	4 mm
Magnification	8,2x	8,2x	8,4x	7,9x	7,9x	7,5x
Eyerelief (mm)	11mm	9 mm	13 mm	10 mm	13 mm	14mm
Field of view (m/1000m)	150m/1000m	150m/1000m	150m/1000m	135m/1000m	130m/1000m	130m/1000m
Close focus (m)	3,8 m	5,7m	4,5 m	2 m	3,8 m	3 m
Prism type	Abbe-König roof	porro	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof
Diopter range	+/- 3 diopt.	+/- 6 diopt.	+/- 3 diopt.	+/- 5 diopt.	+/- 3 diopt.	+/- 3 diopt
Range between both eyes	55-72 mm	54-76 mm	56-75 mm	56-72 mm	56-75 mm	55-75 mm
Rev. CF-∞	1,3		1,5	1,2	1	0,7
Phase correction coating	No	Not necessary	No	Yes	No	Yes
Light transmission 500 nm 550 nm	 78,9% 82%	 74,4% 77,4%	 67,7% 70,7%	 75,2% 77,4%	 75,2% 78,9%	 82,7% 86,5%
Body cover	Black hard rubber	Green hard rubber	Black leather	Black hard rubber	Black leather	Black hard rubber
Color reproduction						
Accessories						
Waterproof	No	Yes	No	Yes	No	Yes
Handling comfort	Excellent	To wheep for decades	Very good	Very good	Very good	Very good
Warranty						
Price (euro)						
Final judgment						

Table 7

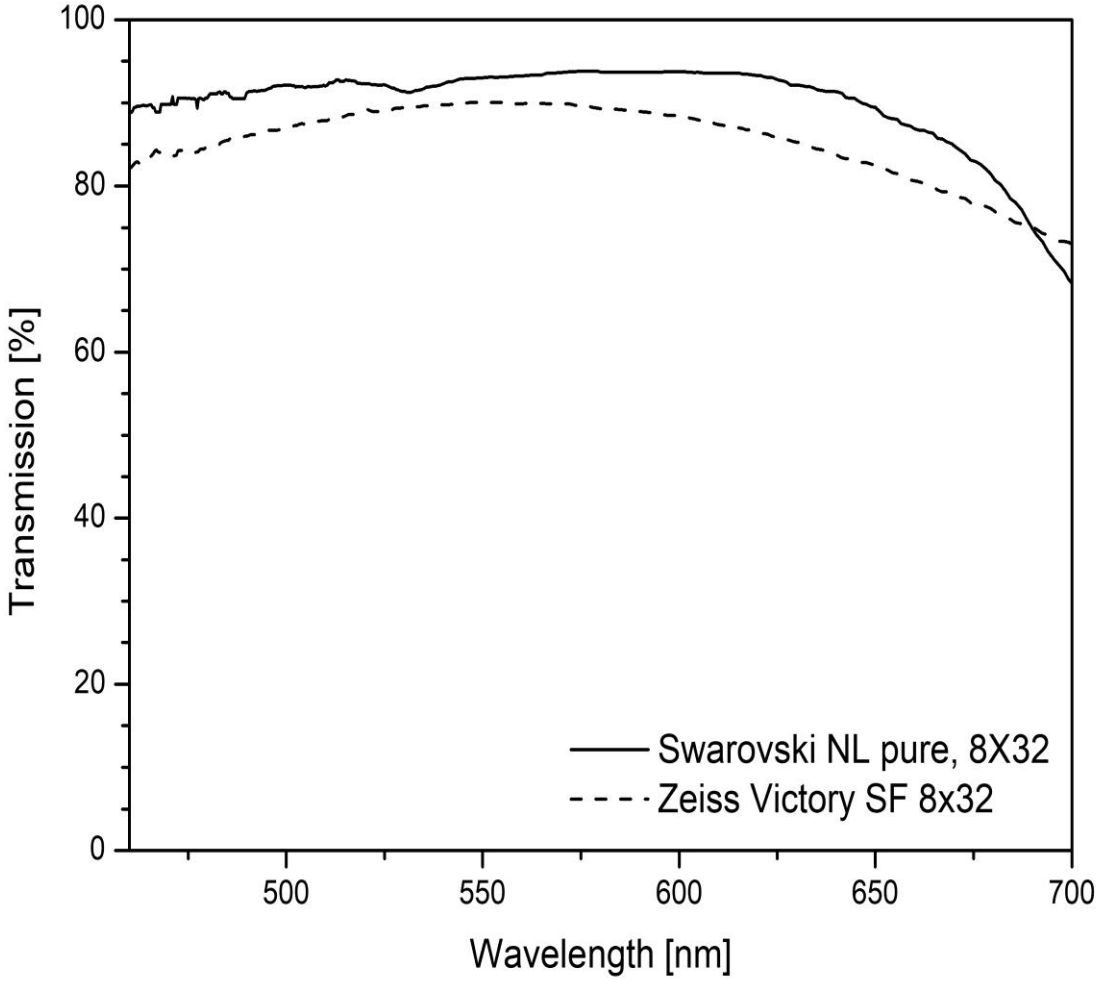
Binocular	**Nikon 8x30, military GA,**	**Canon 8x32 GA**	**Zeiss Conquest Mark1, 8x30**	**Minolta 8x32**	**Zeiss Dialyt 8x30 GA (1967-1990?)**
Weight (g)	665 g	742 g	548 g	539 g	657 g
Close focus	9 m	4,7 m	3 m	3,8 m	5,5m
Field of View (m/1000m)	131m/1000m	131m/1000m	120m/1000m	122m/1000m	120m/1000m
Sharp part of FOV (m/1000m)					
Filled with dry nitrogen to prevent fogging	Yes	No	Yes	No	Yes
Prism type	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof	Schmidt-Pechan roof
Phase correction coating for optimal sharp images	No	No	Yes	No	No
Diopter range	+/- 5 diopt.	+/- 6 diopt.	+/- 5 diopt.	+/- 3 diopt.	+/- 5 diopt.?
Adjustable range between the eyes	55-74 mm	55-75 mm	53-75 mm	55-74 mm	56-75 mm
Number of rotations from close focus to infinity	5	1	1,4	1,7	1
Measured exit pupil **P**	3,85 mm	3,8 mm	3,7 mm	3,8 mm	3,9 mm
Measured objective diameter **O**	30,5mm	31,9mm	30,5 mm	32,2 mm	29,8 mm
Calculated magnification **V= O/P**	7,7x	8,4x	8,2x	8,5x	7,6x
Light transmission 500 nm (night) 550 nm (day)	 75,9% 78,2%	 53,8% 60,9%	 77,8% 79,7%	 54,1% 58,6%	 84,2% 86,1%
Eyecups	Foldable rubber	Foldable rubber	Turn up/down	Foldable rubber	Foldable rubber
Eye relief in mm	13mm	14mm	15 mm	13mm	13 mm
Suited for spectacle users	No	Probably	yes	no	no
Remnants of color dispersion (chromatic aberration)					
Color reproduction					
Body cover	Green hard rubber	Gray hard rubber	Black rubber	Black hard rubber	Green hard rubber
Accessories	Eyepiec and objective caps, enforced strap	Bag	Bag	Bag	Eyepiec and objective caps, enforced strap
Garantee					
Service					
Price					

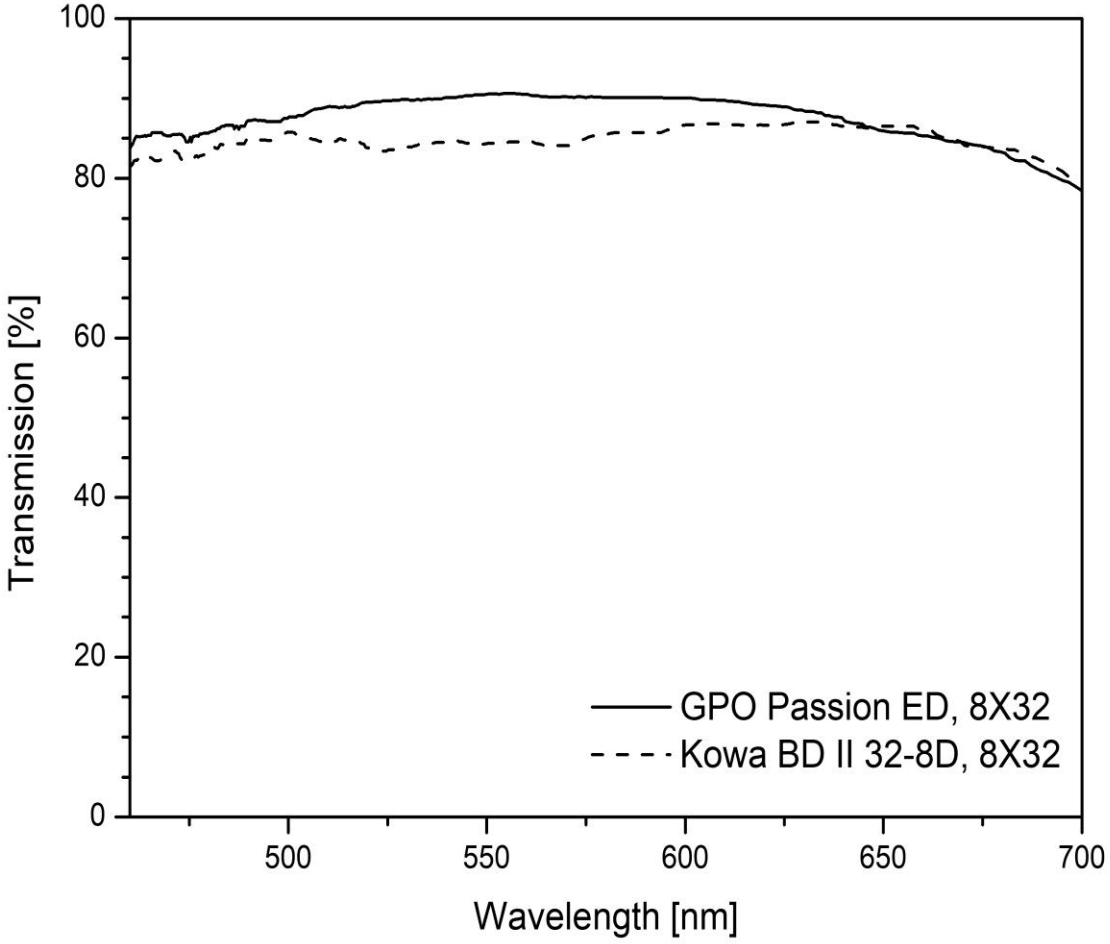
MEASURED DATA OF THE LEICA GEOVID 8X42 BD

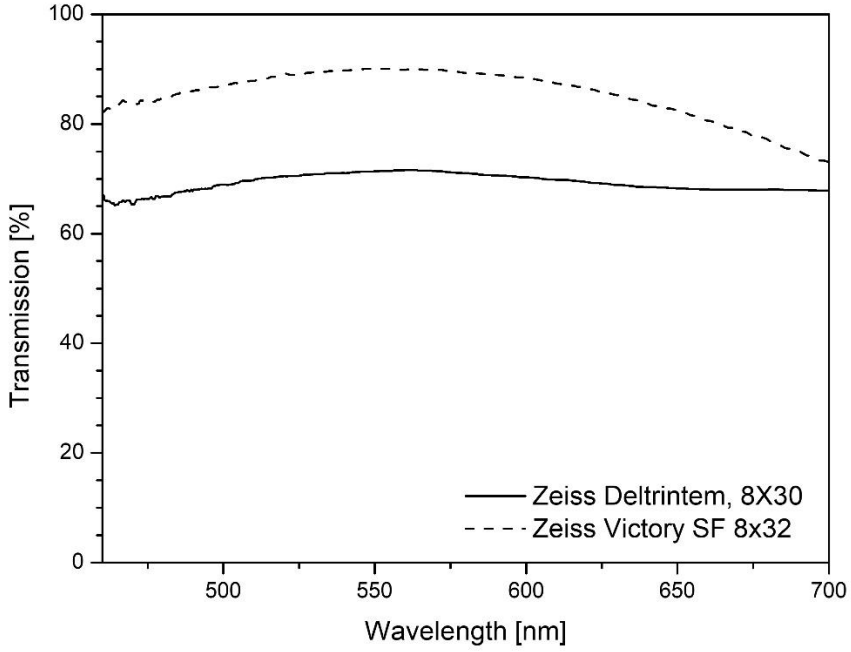
Picture 18. *Different rangefinders to compare with the Leica Geovid 8x42 BD*: f*rom left to right: Swarovski Laserguide 8x30, Swarovski EL Range 8x42, Leica Geovid 8x42 BD, Leica Geovid 8x42HD, Zeiss 8x45 RF, Zeiss RPF 8x26*

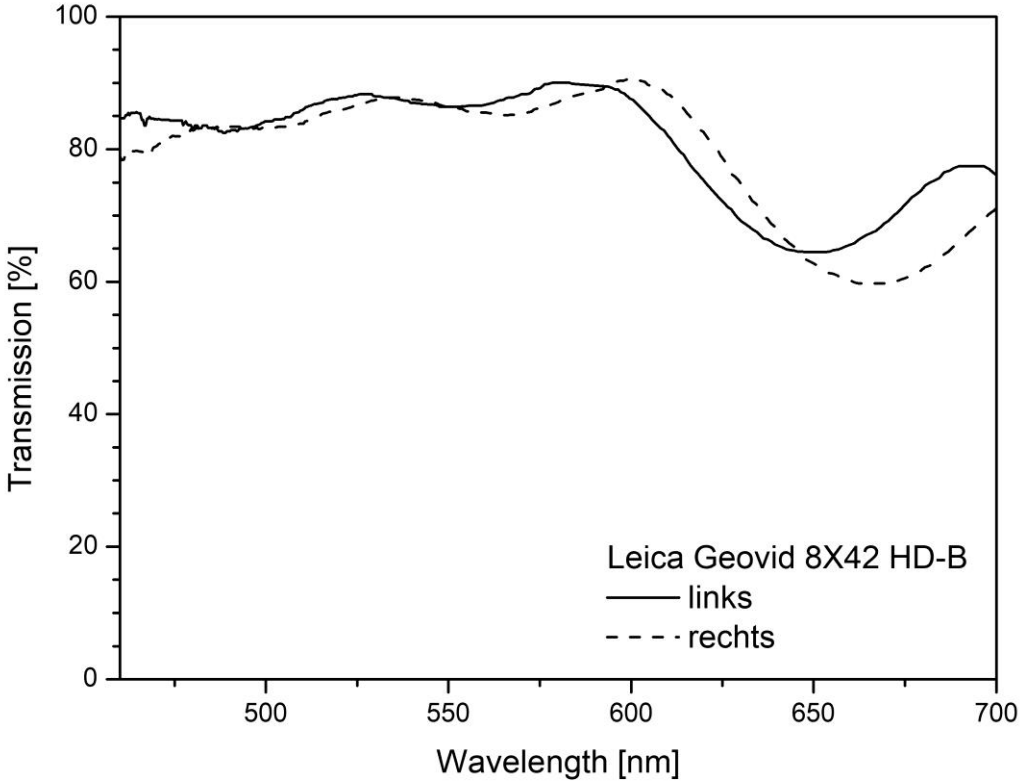
TABLE 8
DATA FROM DIFFERENT RANGEFINDER BINOCULARS IN COMPARISON WITH THE LEICA GEOVID 8X42BD

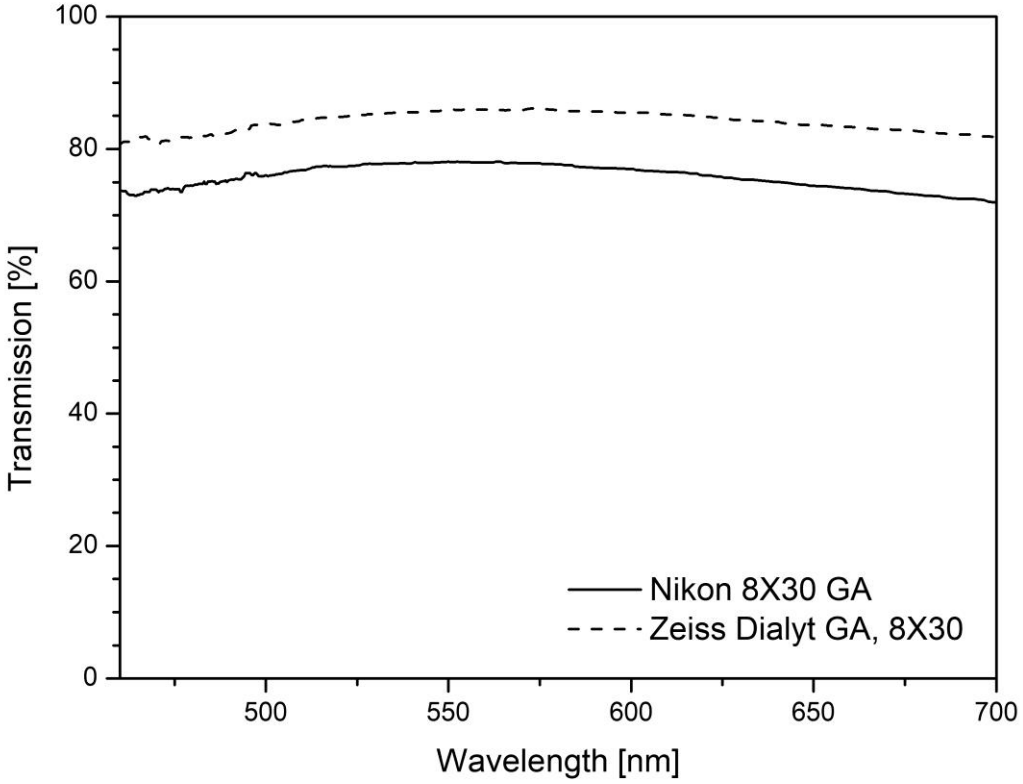
Kijker	**Leica Geovid 8x42HD**	**Swarovski EL Range 8x42**	**Leica Geovid BD 8x42**	**Zeiss Victory RF 8x45**
Weight (g)	961 g	918 g	**1002 g**	1035 g
Close focus (m)	5,5 m	4,3 m	**5 m**	4,5 m
Waterproof	Yes	Yes	**Yes**	Yes
Filled with dry nitrogen	Yes	Yes	**Yes**	Yes
Prism type	(Gemodificeerd) Uppendahl roof	Schmidt-Pechan roof + HR mirror	**Perger=modified porro**	Schmidt-Pechan roof + HR mirrorl
Phase correction coating	Yes	Yes	**Not necessary**	Yes
Hydrofobic coating	Yes	Yes	**Yes**	Yes
Field of View (m/1000m)	125m/1000m	137m/1000m	**130m/1000m**	125m/1000m
Sharp edges				
Nr of rotations CF to infinity	1,75	2	**1,8**	1
Measured exit pupil **P** (mm)	5,1 mm (left) 5,1 mm (right)	5,25 mm (left) 5,25 mm (right)	**5 mm (left)** **5 mm (right)**	5,65 mm (left) 5,65 mm (right)
Measured objective diameter **O** (mm)	41,95 mm (left) 41,95 mm (right)	42,5 mm (left) 42,5 mm (right)	**41,5 (left)** **41,1 (right)**	45 mm (left) 45 mm (right)
Calculated magnification **V= O/P**	8,2x (left) 8,2x (rights)	8,1x (left) 8,1x (right)	**8,3x (left)** **8,222x(right)**	8x (left) 8x (right)
Light transmisson 500 nm (night) 555 nm (day)	Left Right 80% 80% 80% 84%	Left Right 89% 89% 94% 94%	**Left Right** **84,2% 86,5%** **83,4% 86,5%**	Links Rechts 87% 78% 83% 75%
Diopter correction	+/- 3,5 diopt.	-7/+5 diopt.	**+/- 4 diopt.**	+/- 4 diopt.
Eyecups	Bajonet mount	Screw mount	**Bajonet mount**	Screw mount
Eye relief mm	18 mm	19,3 mm	**19 mm**	16 mm
Suited for spectacle users	Yes	Yes	**Yes**	Yes
Color reproduction	Good	Good	**Good**	Good
Body cover	Hard rubber,black	Hard rubber, green	**Hrd black rubber**	Hard rubber, black
Handling comfort	Good	Excellent	**Excellent**	Very good
Accessories	Bag, strap, raincover, objective covers	Bag, raincover, objective covers	**Bag, strap, raincover, objective covers**	Bag, raincover, objective covers
Garantee	10 years	10 years	**10 years**	10 years
Prce (euro)				

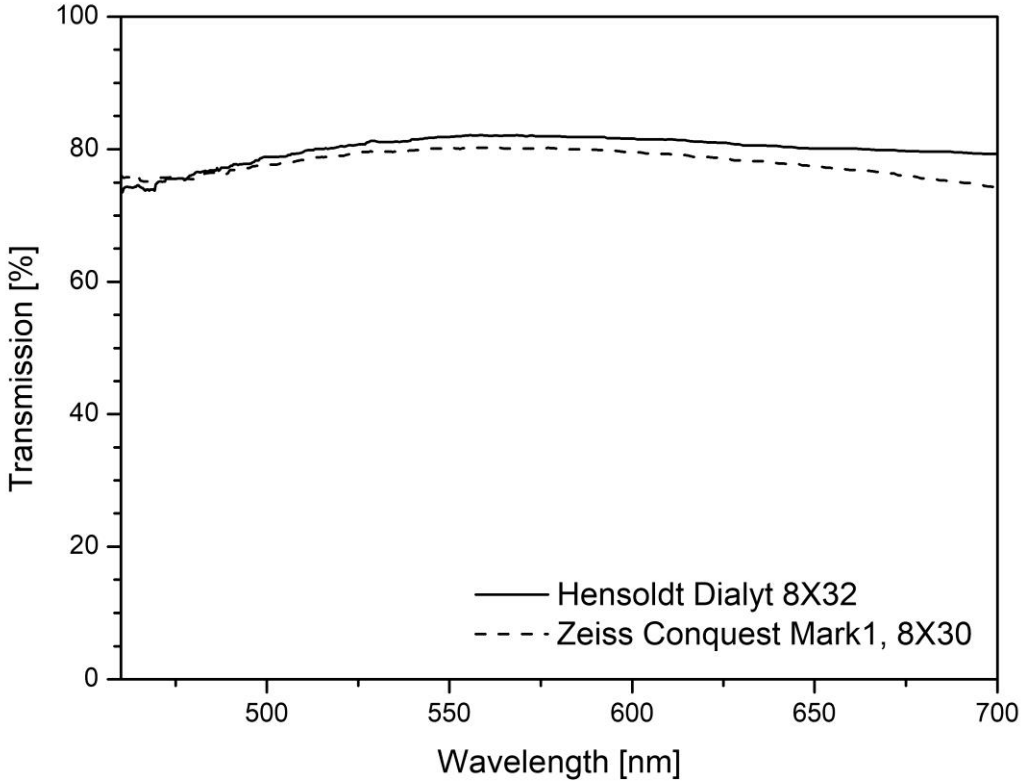

100
80
60
40
20
0
Transmission [%]
500
550
600
650
700
Wavelength [nm]
Swarovski NL pure, 8X32
Zeiss Victory SF 8x32

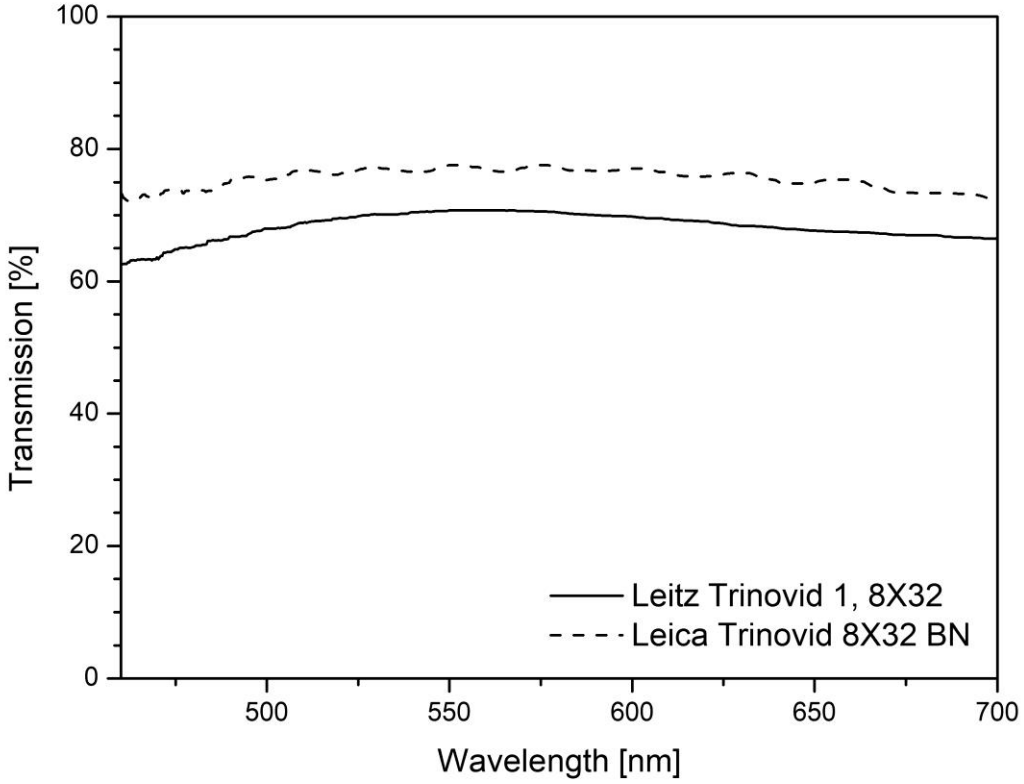

100
80
60
40
20
0
Transmission [%]
500
550
600
650
700
Wavelength [nm]
GPO Passion ED, 8X32
Kowa BD II 32-8D, 8X32

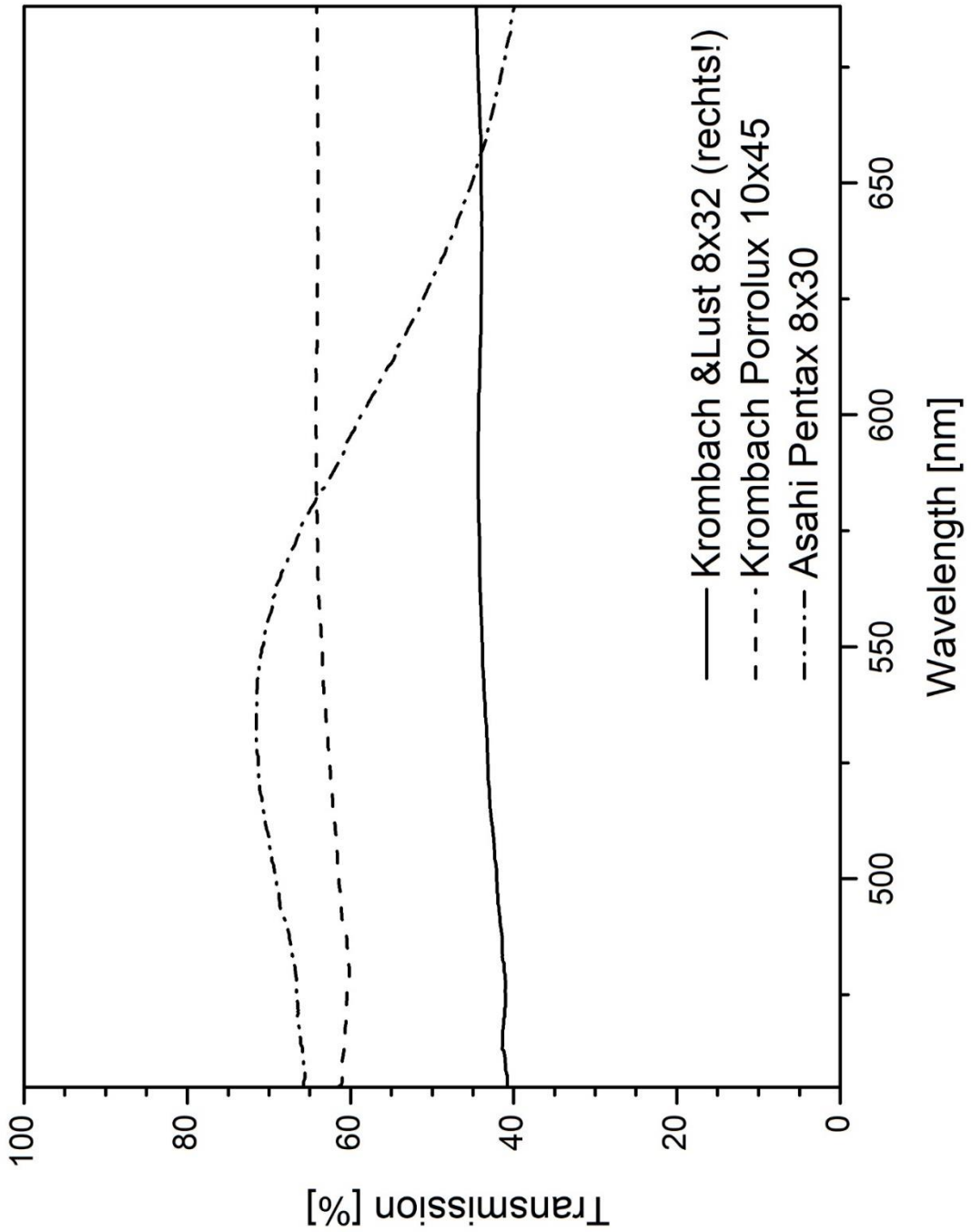

100
80
60
40
20
0
Transmission [%]
500
550
600
650
700
Wavelength [nm]
Zeiss Deltrintem, 8X30
Zeiss Victory SF 8x32

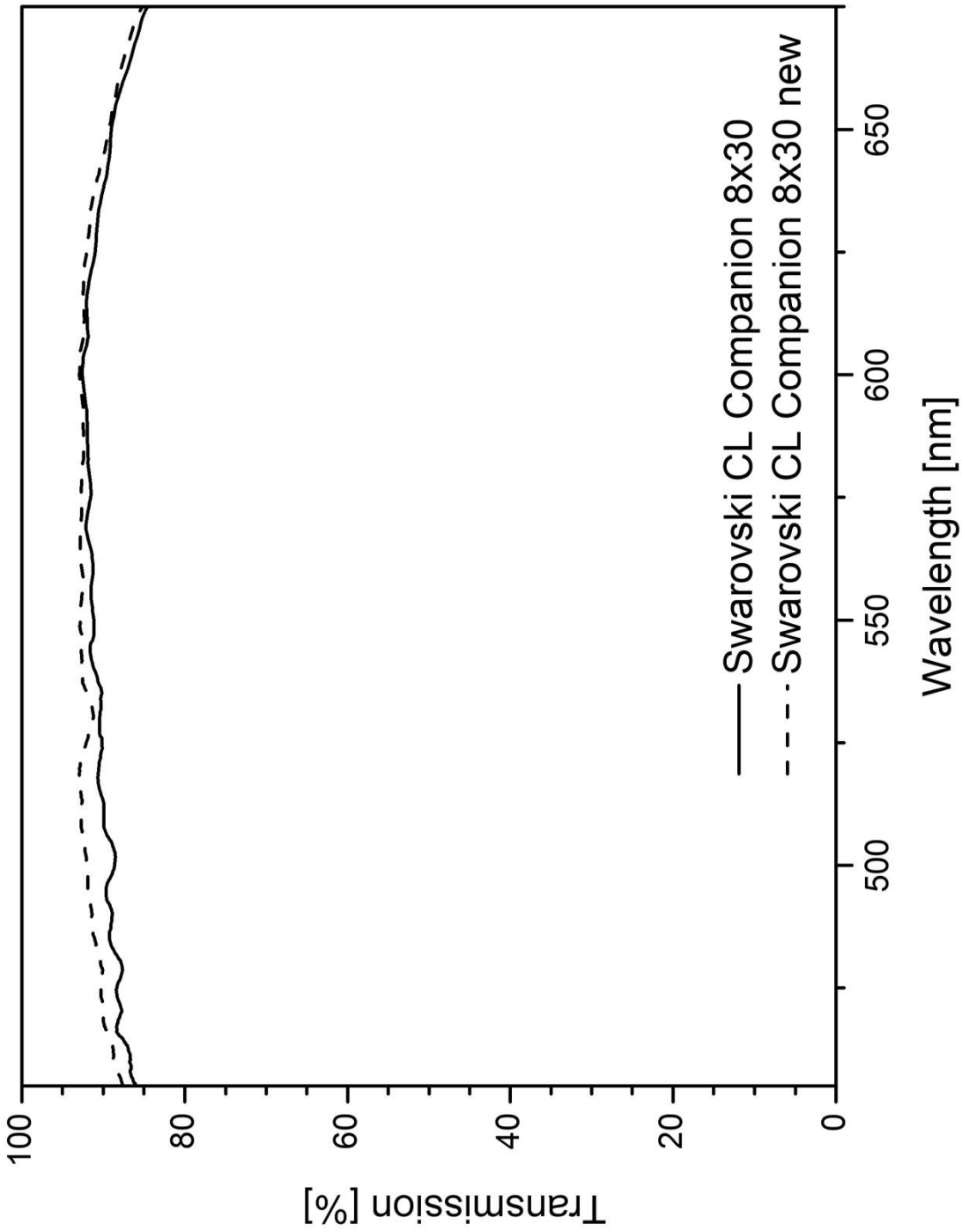

Transmission [%]
Wavelength [nm]
Leica Geovid 8X42 HD-B
links
rechts

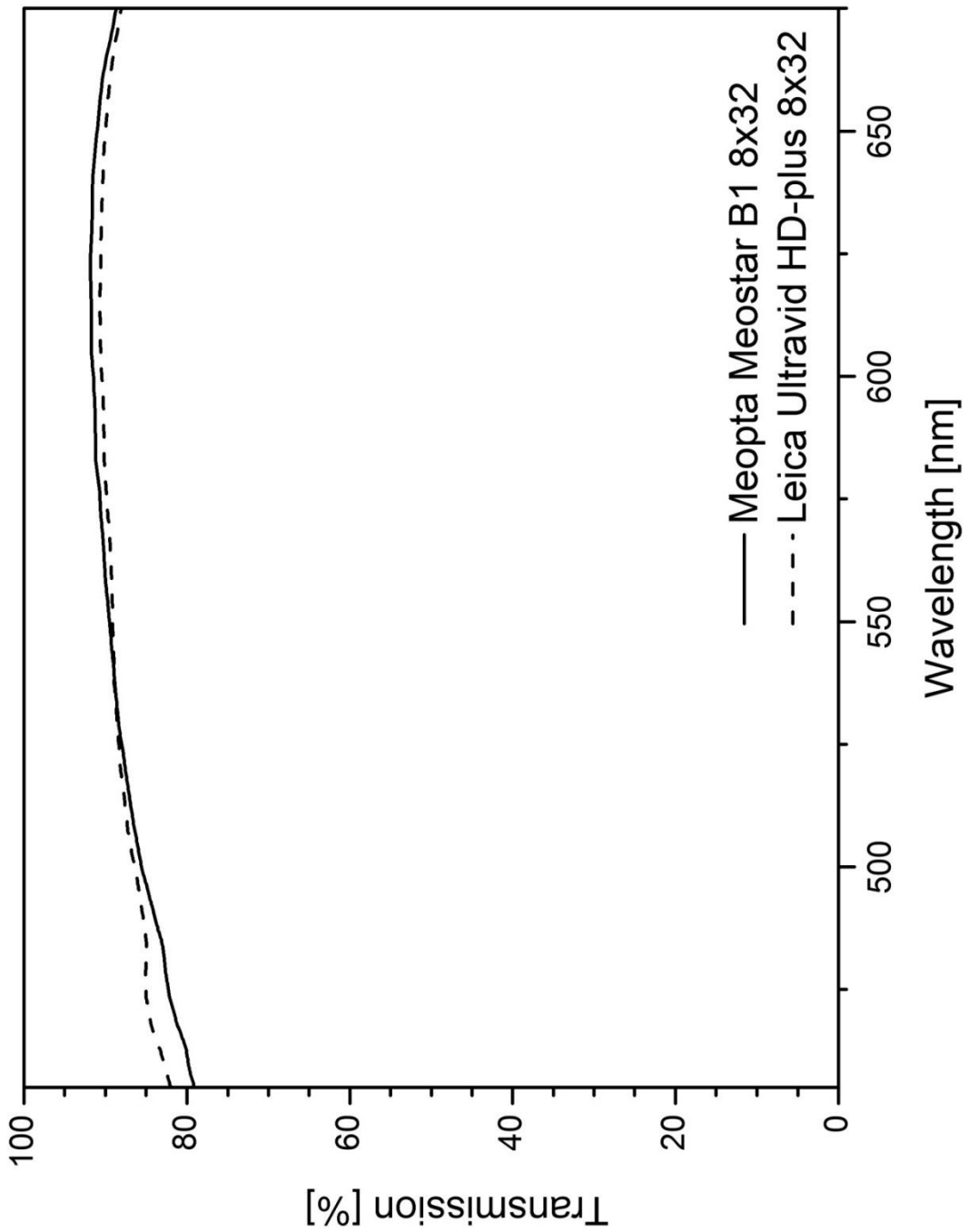

Transmission [%]
Wavelength [nm]
Nikon 8X30 GA
Zeiss Dialyt GA, 8X30

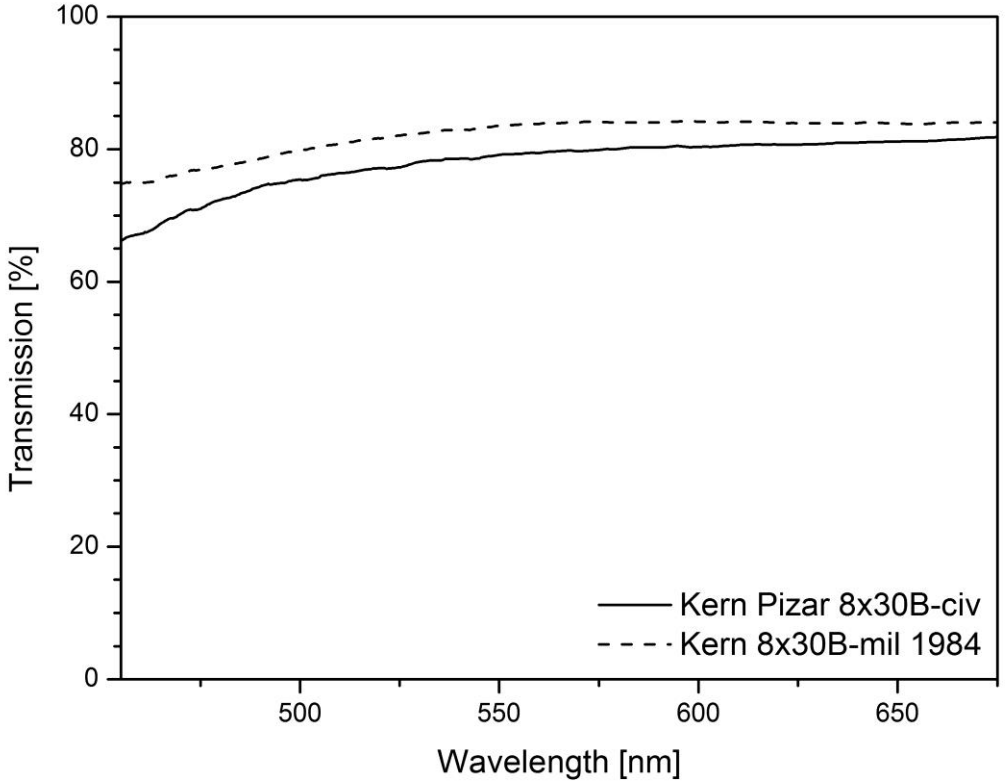

100
80
60
40
20
0
Transmission [%]
500
550
600
650
700
Wavelength [nm]
Hensoldt Dialyt 8X32
Zeiss Conquest Mark1, 8X30

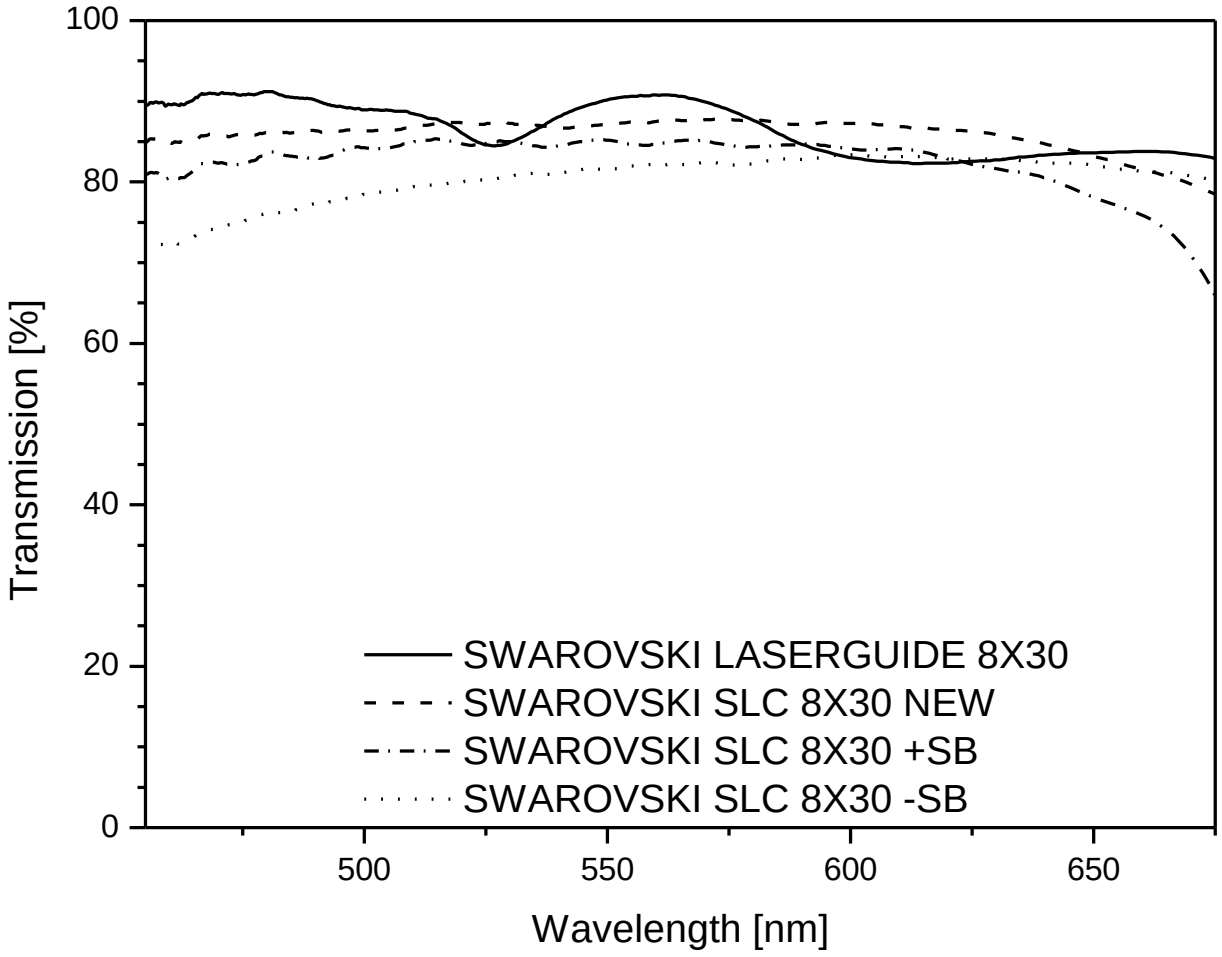

100
80
60
40
20
0
Transmission [%]
500
550
600
650
700
Wavelength [nm]
Leitz Trinovid 1, 8X32
Leica Trinovid 8X32 BN

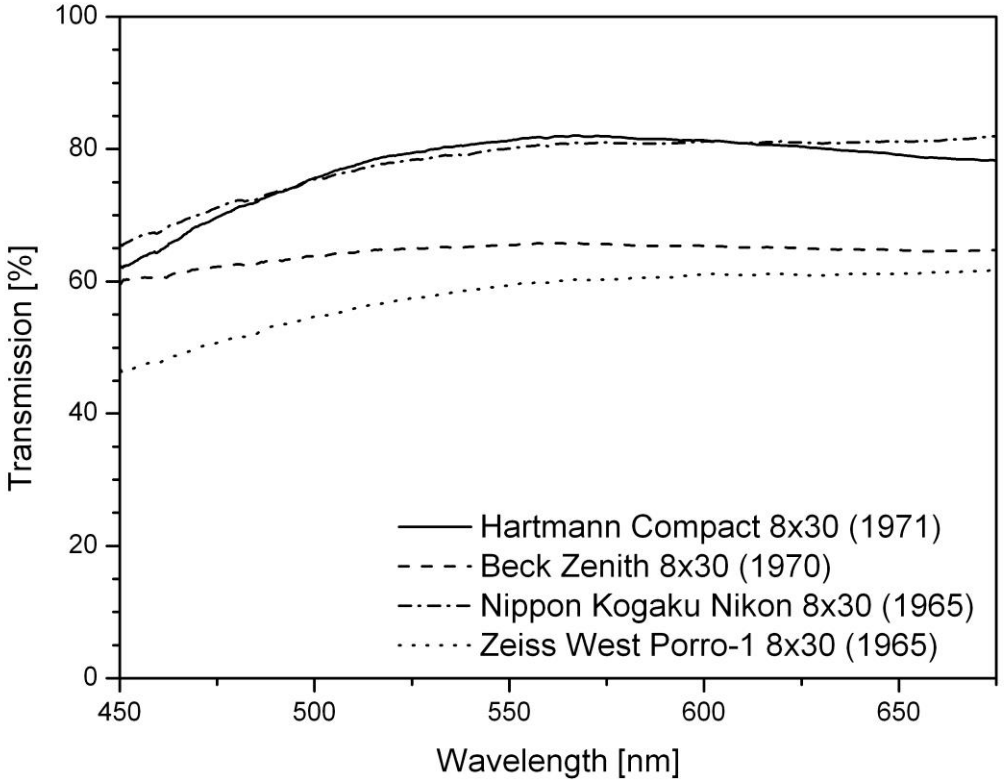

Transmission [%]
0
20
40
60
80
100
500
550
600
650
Wavelength [nm]
Krombach &Lust 8x32 (rechts!)
Krombach Porrolux 10x45
Asahi Pentax 8x30

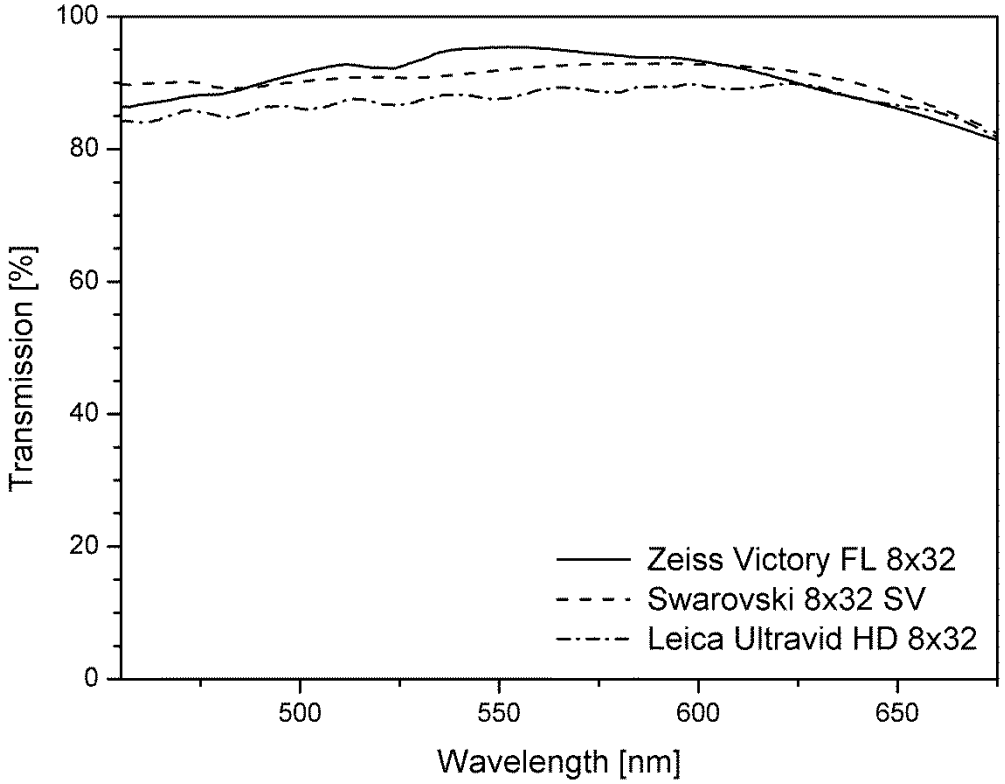

Transmission [%]
100
80
60
40
20
0
500
550
600
650
Wavelength [nm]
Swarovski CL Companion 8x30
Swarovski CL Companion 8x30 new

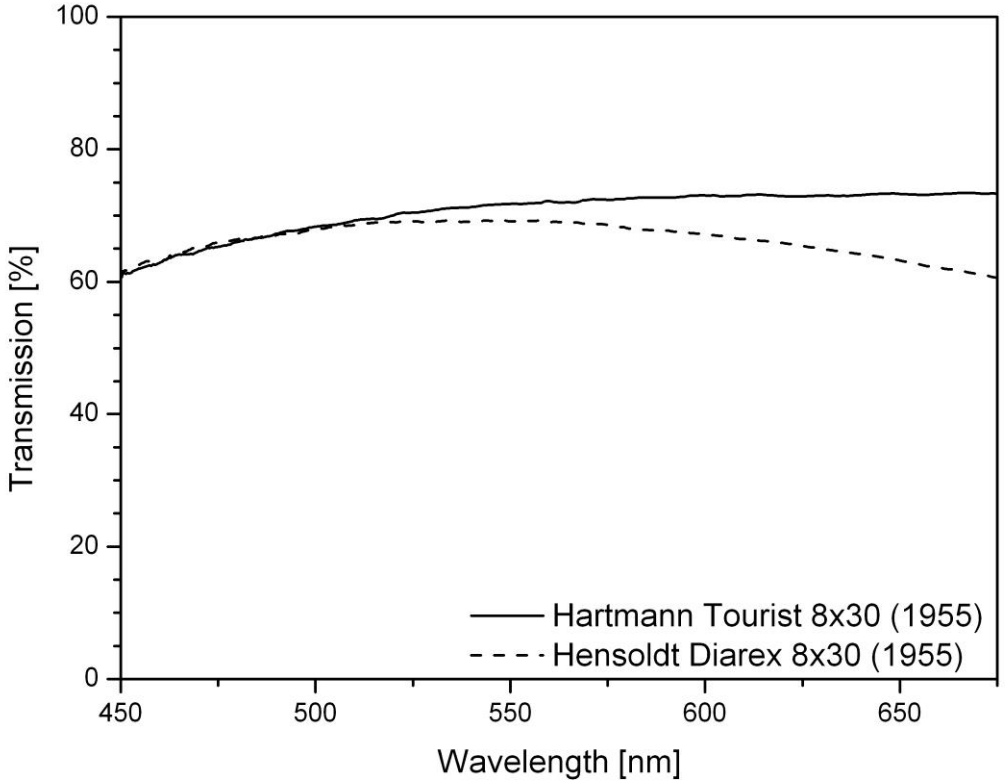

Transmission [%]
100
80
60
40
20
0
500
550
600
650
Wavelength [nm]
Meopta Meostar B1 8x32
Leica Ultravid HD-plus 8x32


100
80
60
40
20
0
Transmission [%]
500
550
600
650
Wavelength [nm]
Kern Pizar 8x30B-civ
Kern 8x30B-mil 1984


100
80
60
40
20
0
Transmission [%]
500
550
600
650
Wavelength [nm]
SWAROVSKI LASERGUIDE 8X30
SWAROVSKI SLC 8X30 NEW
SWAROVSKI SLC 8X30 +SB
SWAROVSKI SLC 8X30 -SB


Transmission [%]
Wavelength [nm]
100
80
60
40
20
0
450
500
550
600
650
Hartmann Compact 8x30 (1971)
Beck Zenith 8x30 (1970)
Nippon Kogaku Nikon 8x30 (1965)
Zeiss West Porro-1 8x30 (1965)


Transmission [%]
Wavelength [nm]
Zeiss Victory FL 8x32
Swarovski 8x32 SV
Leica Ultravid HD 8x32


Transmission [%]
Wavelength [nm]
Hartmann Tourist 8x30 (1955)
Hensoldt Diarex 8x30 (1955)