INSTRUCTIONS FOR USE
Contact glasses & magnifying glasses
Goldmann/Diagnostics/Laser
10. Edition / 2015 – 02

HAAG-STREIT DIAGNOSTICS
Introduction
Thank you for choosing a HAAG-STREIT product. Provided you comply carefully with the regulations in this instructions for use, we can guarantee the reliable and problem-free use of our product.

Purpose
Contact glasses are used for diagnostics and/or laser treatment of human eyes. They are primarily used in doctor's practices, hospitals and universities, under normal ambient conditions.

The 81 D lens is used for the contact-free examination of the fundus in the human eye. It is used together with a slit lamp. Laser treatments at a wavelength range of 450 to 650 nm are also possible. The 81 D lens is used in doctor's practices, hospitals and universities, under normal ambient conditions. It is used by ophthalmologists and optometrists following qualification by suitable training.

ATTENTION!
Federal law restricts this devices to sale by or on the order of a physician or practitioner.
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1 Safety

Symbols
Symbols correspond to the EN 980 and ISO 15223-1 standards. Other symbols that are used in this instructions for use:

![PROHIBITED!]
Failure to comply with these instructions can result in material damage and pose a danger to users and patients.

![WARNING!]
These instructions must be complied with absolutely in order to guarantee safe use of the products and to avoid any risk to users and to patients.

![NOTE!]
Important notes. Please read carefully.

1.1 Ambient conditions

Transport:
- Temperature: from -40°C to +70°C
- Air pressure: from 500 hPa to 1060 hPa
- Relative humidity: from 10% to 95%

Storage:
- Temperature: from -10°C to +55°C
- Air pressure: from 700 hPa to 1060 hPa
- Relative humidity: from 10% to 95%

Use:
- Temperature: from -10°C to +35°C
- Air pressure: from 800 hPa to 1060 hPa
- Relative humidity: from 30% to 75%

1.2 Shipment and unpacking

- Before unpacking the contact glasses and magnifying glasses, check whether the packaging shows traces of incorrect handling or damage. If this is the case, notify the transport company that has delivered the goods to you. Unpack the contact glasses and magnifying glasses together with a representative of the transport company. Make a report of any damaged parts. This report must be signed by you and by the representative of the transport company.
- Leave the contact glasses and magnifying glasses in the packaging for a few hours before unpacking (condensation).
- After unpacking, check the contact glasses and magnifying glasses for damage.
- Return defective contact glasses and magnifying glasses in the appropriate packaging.
- Store packaging material carefully, so that it can be used for possible returns or when moving.

1.3 Operation, environment

![NOTE!]
• The contact glasses and magnifying glasses may only be used for the purpose described in these instructions for use.
• The contact glasses and magnifying glasses may not be transported, stored or used in ambient conditions other than those prescribed, see section 'Ambient conditions' (chapter 1.1, page 4).
• Keep these instructions for use in a place where they are accessible at all times to persons who work with the contact glasses and magnifying glasses.
• Warranty claims can only be made if the instructions in these instructions for use are complied with.
• The manufacturer of the contact glasses and magnifying glasses is not liable for loss or damage due to unauthorized handling of the same. All warranty claims arising in this case are null and void.

There is no absolute contraindication for the use of contact glasses and magnifying glasses. Appropriate professional assessment and caution are necessary.
WARNING!
• The physician or the operator is obliged to inform the patient of the safety instructions that concern him, and to ensure that these instructions are complied with.
• The examination of the patient, the use of contact glasses and magnifying glasses, and the interpretation of the results may only be conducted by trained and experienced individuals. All users must be appropriately trained and familiarized with the contents of the instructions for use, especially in regard to the safety instructions contained therein.
• The contact glasses and magnifying glasses must be inspected following an external impact (e.g. accidental blow or fall) and must be sent to the factory for repair if necessary or if possible.

PROHIBITED!
Never use the contact glasses or magnifying glasses to look directly at the sun.

NOTE!
• Only to be used by qualified and trained personnel. The training of such personnel is the responsibility of the user.
• Only HAAG-STREIT accessories may be used.

WARNING!
To the extent possible, do not conduct an examination in the event of eye infections or injured corneas!

1.4 Cleaning and disinfection of contact glasses

WARNING!
Contact glasses are not shipped in disinfected state and must be cleaned and disinfected before their first use in accordance with the separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses and Desinset.

WARNING!
• Preparation may only be conducted by qualified and trained personnel. Their training is the responsibility of the user.
• Appropriate professional assessment and caution are necessary.
• Only use clean, undamaged and disinfected contact glasses!
• Please observe the separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses and Desinset!
• The operator will be liable in the event of non-observance of the cleaning and disinfecting process!

NOTE!
• Only those disinfectants tested by HAAG-STREIT for material compatibility may be used for disinfection.
• The current list is enclosed with every contact glass and can also be found on the HAAG-STREIT AG website (www.haag-streit.com).
• The separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses and Desinset must be consulted regarding the exact mode of action, contact time and dwell time.

PROHIBITED!
• Disinfection with alcohol
• Cleaning with acetone
• Disinfection using UV radiation
• Sterilization using steam or ethylene oxide
• Temperatures above 60°C

NOTE!
• Improper preparation can result in the transmission of diseases to the patient and user as well as damage to the contact glasses.
• Residue from cleaning agents and disinfectants may irritate and burn the patient’s eye.
NOTE!
• As a rule, the contact glasses may be treated together with each other, but not with any other products.
• In order to achieve efficient disinfection and storage of contact glasses, we recommend use of our Desinset as well as the disinfectant ‘Sekusept Forte S’. This set was successfully used by the accredited testing laboratory HS System- und Prozesstechnik GmbH, 65779 Kelkheim, Germany, when validating the cleaning and disinfection processes – see separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses and Desinset.
  • The validation report is available from HAAG-STREIT on request.
  • A summary of the validation report can be found on the HAAG-STREIT website (www.haag-streit.com).
  • The operator accepts all liability for the use of other disinfectants.

1.5 Visual inspection of the contact glasses for damage

PROHIBITED!
Never use damaged contact glasses.

• Inspect the contact surface of the contact glasses for contamination or damage (scratches, cracks, chips or sharp edges). To do so, it is best to use the slit lamp microscope at 10x to 16x magnification.
• Disinfectants may seep into cracks or defective sealant at the front part of the contact glasses, causing eye irritations for the patient.
• Contact glasses that have allowed condensation to penetrate to the interior may no longer be used.

1.6 Warranty and product liability

• The product should be handled as described in the “Safety” chapter. Improper handling may damage the product. This will void all guarantee claims.
• Continued use of a product damaged by incorrect handling may lead to personal injury. In this case, the manufacturer accepts no liability.
• Repairs and modifications to the product must only be performed by HAAG-STREIT service technicians or by authorised personnel.

2. Use of contact glasses

WARNING!
It is imperative to read the “Safety” chapter and to observe its precautions before using the contact glasses.

2.1 Fundamentals

• A prerequisite for the successful use of contact glasses is good anaesthetisation of the cornea and conjunctiva with an agent that does not damage the corneal epithelium.
• The space between the eye and contact glass is filled with Methocel 2%, an isotonic fluid that is innocuous to the cornea and conjunctiva.
• Temperature fluctuations only have a marginal effect on the viscosity of the contact fluid; the fluid does not drip during use and the appearance of air bubbles is also largely impeded.

2.2 Positioning of the contact glasses

• The contact glass can now make contact with the anaesthetised eye while the patient’s head remains supported by the headrest. The patient is asked to look upwards while the examiner gently pulls the lower eyelid downwards, away from the eyeball.
• If necessary, the upper eyelid is pulled upwards using the thumb of the other hand. The contact glass, which has been wetted with a drop of Methocel, is placed on the conjunctiva. The patient is then asked to look straight ahead, at which time the contact glass can slide over the cornea. Any existing air bubbles can be dissolved by tilting and turning.
### 2.3 Product overview

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<th>Model</th>
<th>Scleral flange</th>
<th>Laser *</th>
<th>Mirror</th>
<th>Area</th>
<th>Magnification</th>
<th>Magnification laser spot on retina</th>
<th>Field of vision</th>
<th>Mirror angle</th>
<th>Ball radius [mm]</th>
<th>ø Contact [mm]</th>
<th>ø Exterior contact [mm]</th>
<th>Height [mm]</th>
<th>Weight [g]</th>
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<th>Argon/diode/YAG 532/450 nm – 650 nm</th>
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</table>

Laser * loading capacity ≥ 2000 J/cm², ≥ 5x10³ W/cm²
2.4 Product description

The contact glasses produced at the suggestion of Prof. Goldmann, for examination of the chamber angle and the ocular fundus with a slit lamp, are valuable diagnostic tools that have proven their worth in ophthalmologic practice and in research.

With the help of the HAAG-STREIT slit lamp 900, they allow for binocular and stereoscopic observation of the optical cross section of the entire eye, even under unfavourable conditions, (cloudy media, relatively narrow pupils, and myopia).

Handling of the contact glasses on the HAAG-STREIT slit lamp 900 is eased by the relatively small distance between patient and examiner.

Name
• Laser contact glasses are designated with an "L".
• Contact glasses designated with an "S" feature a special scleral flange that serves as an eyelid block.

L = Laser
S = Scleral

Material
• Contact glasses for exclusively diagnostic purposes are made out of acrylic glass.
• Contact glasses for laser treatment are made of mineral glass or have a coated mineral protection glass. The antireflection is achieved with a highly-resilient layer with high adhesive strength for the applicable laser wavelengths.

Stery Cup
• Contact glasses designated with a symbol can be used together with the HAAG-STREIT Stery Cup.
2.5 Direct contact glasses for diagnostic purposes

2.5.1 Contact glass 901
This is used for binocular slit examination of the pupil, the macula and its surrounding area up to 30°, as well as the central cross section of the vitreous body. The refractive power measures –64 diopters. The linear, axial, and angular enlargement will depend on the refraction of the eye to be examined, and is important for measurements in the ocular fundus and the vitreous body.

The glass weighs 1.5 g and consists of two parts: the optically-active lens with haptic, and the funnel for comfortable handling of the contact glass. The optically-active surface has a diameter of 12 mm. Lens made of acrylic glass.

Examination of the ocular fundus
Before examination with the fundus contact glass, a maximum mydriasis is desirable. Anaesthesia and positioning of the contact glass using Methocel 2%, see section ‘Fitting of contact glasses’ (chapter 2, page 6).

The patient's eye is guided to the desired position using the fixation light, and the area to be examined is observed at 10x or 16x magnification using the brightest possible narrow slit.

During examination, a binocular, stereoscopic slit examination is primarily aimed for. For this purpose, the widest-possible angle between illumination and the microscope is advantageous. At the start of the examination the angle is small, and is enlarged as soon as the slit image is viewed binocularly.
2.6 Mirror contact glasses for diagnostic purposes

2.6.1 One-mirror contact glass 902/902 S
This allows for examination of the anatomical conditions in the area of the anterior chamber area and weighs 4.2 g. The lens is made of acrylic glass.
The breadth and shape of the chamber angle can only be ascertained using a narrow slit beam.
Thanks to its turning, swivelling, and tilting slit illumination, the HAAG-STREIT slit lamp 900 allows primarily for evaluation of the width of the entire chamber angle, which is important for a glaucoma diagnosis.

Examination of the ocular fundus
A magnification of 10x is best for initial adjustments and 16x is best for the actual examination.
The chamber angle is illuminated with a narrow slit via the contact glass mirror. An angle of approximately 10° (lateral dwell position for the HAAG-STREIT slit lamp 900) is set between the illumination instrument and the microscope. If the angle between the microscope and the illumination instrument is larger than 15°, the slit image will no longer be sharp in the eyepiece’s normal setting.
Blurry slits at angles smaller than 15° may be corrected by altering the position of the chamber angle lens.
It is also possible to examine the lateral chamber angle sections using diffuse lighting on the scleral fold. To do so, the illumination must be removed from the centre (after loosening the centering screw on the HAAG-STREIT slit lamp 900).
2.6.2 Two-mirror contact glass 905/905 S

Two mirrored surfaces, each inclined at an angle of 62° towards the front surface, have been cut into the acrylic glass cone. This makes it possible to examine the opposite chamber angles without turning the contact glass. The width and shape of the chamber angle can only be ascertained using a narrow slit beam. Thanks to its turning, swivelling, and tilting slit illumination, the HAAG-STREIT slit lamp 900 allows primarily for evaluation of the width of the entire chamber angle, which is important for a glaucoma diagnosis.

Examination of the chamber angle

A magnification of 10x is best for initial adjustments and 16x is best for the actual examination. The chamber angle is illuminated with a narrow slit via the contact glass mirror. An angle of approximately 10° (lateral dwell position for the HAAG-STREIT slit lamp 900) is set between the illumination instrument and the microscope. If the angle between the microscope and the illumination instrument is larger than 15°, the slit image will no longer be sharp in the eyepiece's normal setting. Blurry slits at angles smaller than 15° may be corrected by altering the position of the chamber angle lens. It is also possible to examine the lateral chamber angle sections using diffuse lighting on the scleral fold. To do so, the illumination must be removed from the centre (after loosening the centering screw on the HAAG-STREIT slit lamp 900).
2.6.3 One-mirror contact glass 904

This one-mirror contact glass, made of acrylic glass, serves to examine the ora serrata, the pars plana and the extreme peripheral sections of the vitreous body and the ocular fundus.

Examination of the ora serrata

After the eye is anaesthetized, 2 drops of Methocel 2% are applied to the concave side of the contact lens. It is helpful to press down the lower eyelid using the depressor, have the patient look upwards, and then gently pull the upper eyelid upwards with the thumb of the other hand. The ora serrata one-mirror contact glass is then placed on the cornea and the patient is requested at the same time to look straight ahead.

A dilation of the pupil by more than 8 mm will enable observation of the ora serrata and its entire surrounding area.

NOTE!

For cleansing and disinfection purposes, the ora serrata one-mirror contact glass is to be dismantled into its three component parts. The individual parts are to be treated pursuant to the separate instructions for use on cleaning and disinfection of tonometer measuring prisms, contact glasses and Desinset.

1. Front threaded ring
2. One-mirror contact glass
3. Holder with lever
2.7 General information on three-mirror contact glasses

Examination of the entire ocular fundus and chamber angle. The advantage of a longer mirror is that it often allows for binocular observation of the lateral sections of the ocular fundus.

Zone 1 = Lens (1) Examination of the ocular fundus in the 30°-zone, mostly with a magnification of 10x
Zone 2 = Mirror (2) with an inclination angle of 73°, observation of the area outside of the 30° range
Zone 3 = Mirror (3) with an inclination angle of 66°, observation of peripheral sections of the ocular fundus, and under favorable conditions, of the ora serrata
Zone 4 = Mirror (4) with an inclination angle of 59°, observation of the vitreous body and ocular fundus sections neighboring the ora serrata, and gonioscopic examination

2.7.1 Three-mirror contact glass 903/903 S

The classic contact glass from Professor Goldmann – with or without scleral flange.

2.7.2 Three-mirror contact glass 630/630L

This contact glass is especially suited for slit lamps that feature a smaller distance between the eye and the reduction prism, as compared to the HAAG-STREIT slit lamp 900.
2.7.3  Three-mirror contact glasses for children
906/906 S and 907

Infants:  906/906 S
Up to 4 years of age:  907

The mirrors of these three-mirror contact glasses, especially designed for children,
are smaller than the normal three-mirror contact glasses. The inclination angles are
identical, however.

Two models are available. In the model for infants (model 906), the corneal portion
has an internal diameter of 10 mm and in the model for children up to 4 years of
age (model 907), it has a diameter of 11 mm.
2.8 Contact glass 1210 endothelium according to Eisner
For examination of the corneal endothelium and epithelium, magnification 2.2x.

2.8.1 Using the contact glass 1210
* After removing the protective plug (4) fill the liquid reservoir with Methocel 2 %.
* Insert into the eyelid gap with the release opening (1) or marking (2) facing upwards.

2.8.2 Locating specular reflections
* Slit lamp settings:
  - Magnification: small
  - Slit width: small
  - Angle between slit lamp and microscope: small
  - Sharply focus and centre the optical system with silver-coloured ring (3).
  - Slide the slit lamp until the following appear successively in sharp focus: the reflection of the lens (5) and then the epithelium (6) and endothelium (7) corneal areas being examined.
  - Adjust the contact glass until mirror reflections are illuminated.

2.8.3 Examination of the specular reflections
* Slit lamp settings:
  - Magnification: large
  - Slit width: large
  - Angle between slit lamp and microscope: large

2.8.4 Examination of the periphery of the cornea
* Guide the patient’s line of vision in the desired direction.
* Adjust the contact glass.

2.8.5 Disinfecting the contact glass 1210
* Insert protective plug (4) into the contact glass. Then, proceed according to the separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses and Desinset.
2.9 Use of oculars with reticle according to McIntyre and contact glass 1210

2.9.1 Ocular 25x for HAAG-STREIT slit lamp BM 900
* Insert ocular halfway into microscope tube and hold the cylinder housing firmly with one hand.
* With the other hand, loosen the knurled ocular refraction ring (2) by turning it antici-clockwise about 10°.
* De-focus the reticle by turning the occluder (1) anticlockwise. The knurled ocular refraction ring should not turn with the occluder.
* Slowly turn the occluder clockwise until the reticle appears in sharp focus.
* Tighten the knurled ocular refraction ring.
* Slide in the ocular to the stop point in the barrel.
* Align centre marks vertically.
* Use knurled ocular refraction ring on microscope to adjust dioptre setting to zero.

2.9.2 Ocular 12.5x for HAAG-STREIT slit lamp BQ 900
When adjusting the ocular to the user’s refraction, look towards a light surface and adjust the ocular from the + side by turning the knurled ocular refraction ring with dioptre scale (3) until the eyepiece crosshairs appear sharply focused.

2.9.3 Estimating the cell density of the endothelium without contact glass
* Microscope magnification 40x.
* Reading taken in column 40 x.

with contact glass 1210 acc. to Eisner
* Microscope magnification 25 x (overall magnification: microscope magnification x contact glass magnification = 55 x).
* Take reading of control sample in column 2.2 x 25x.
2.10  Mirror contact glasses for laser use

2.10.1 Gonioscopy contact glass CGAL
The CGAL gonioscopy contact glass was developed by Roussel and Fankhauser for laser treatments of the chamber angle. It is made of laser-resistant glass and has anti-reflection coating\(^1\). It reduces the laser spot by a factor of 1.5 as compared to Goldmann contact glasses. As a result, less energy is required to cut strands during the cataract incision with the YAG laser. Thanks to its magnifying effect, the CGAL contact glass also improves the aiming accuracy and success rate of laser trabeculoplasty.

During office examinations, the CGAL contact glass allows for detection of the fine structures of the trabeculum thanks to its high resolution, and produces excellent photographs and video recordings due to the low-reflectivity coating in the visible spectral area.

**Optical attributes**
The convex entrance surface preserves the laser spot's beam convergence without introducing aberrations. This is the only combination with which high optical resolution can be achieved with a minimal laser spot size.

- Magnification: 1.5x
- Mirror angle: 58°
- Magnification laser spot on retina: 0.66x

\(^1\)Antireflection coating for visual examination and laser treatment: 450–650 nm and 1064 nm.
2.11 Three-mirror contact glasses for laser use

For a description see section 'General information on three-mirror contact glasses' (chapter 2.7, page 13).

Acrylic glass with antireflection coated mineral protection glass for laser use\(^1\).

2.11.1 903 L and 630 L

- **Magnification** 0.91x
- **Magnification laser spot on retina** 1.1x

\(^1\)Antireflection coating for visual examination and laser treatment: 450–650 nm and 1064 nm.

2.11.2 906 L and 907 L

Magnifications vary depending on eye size!
2.12 Direct contact glasses for laser use

2.12.1 Retina contact glass CGRL
The CGRL retina contact glass is a wide angle contact glass designed for laser photocoagulation and diagnosis. It is made of laser-resistant glass and has antireflection coating\(^1\). The optical design with a concave entrance surface allows for wide angle observation and laser treatment without intermediate imaging, and without the associated intermediate focal spot inherent to indirect ophthalmoscopy.

The result is a small, lightweight contact glass that expands the field of vision without increasing the working distance, while guaranteeing an excellent image quality and good resolution. The entire posterior pole, including the temporal vascular arcades, can be viewed simultaneously. It is used for axial and paraxial photocoagulation.

Optical attributes
The CGRL retina contact glass creates an upright virtual image of the ocular fundus. The cone angles of both beams (laser and observation) are reduced from 6° in air to 3.2° in vitreous. As a consequence, the visual field is expanded from 46° to 64°, allowing for observation of the entire posterior pole.

Dioptric power in air \(-50\ D\)
Magnification\(^2\) 0.75x
Field of vision 64°
Magnification laser spot on retina 1.33x

\(^1\) Antireflection coating for visual examination and laser treatment: 450–650 nm and 1064 nm.
\(^2\) The magnification with the Goldmann contact glass is arbitrarily set to 1.
2.12.2 Iridectomy contact glass CGIL

The CGIL iridectomy contact glass was designed by Riquin, Fankhauser et al. to perform full-thickness peripheral laser iridectomies. The use of this contact glass increases the safety and efficacy of the laser procedure. It increases the energy density on the iris while minimizing it on the anterior and posterior structures, such as the cornea and lens capsule. The magnifying effect allows for improved aiming accuracy and a higher success rate. Perfect handling of the contact glass is facilitated by the large diameter. It is made of laser-resistant glass and has antireflection coating.

Optical attributes

The CGIL contact glass increases the cone angle of the laser beam and therefore also the beam diameter on out-of-focus structures, while decreasing the diameter of the focal spot. The effective focal spot reduction is achieved by minimizing spherical aberrations and coma through application of the Young-Weierstrass theorem: The contact glass was designed so that the aplanatic point of the entrance surface falls on the iris, three millimeters behind the cornea.

Dioptic power in air     +5 D
Cone angle magnification  1.6x

2.12.3 Vitrectomy contact glass CGVL
The CGVL vitrectomy contact glass was designed by Rol, Fankhauser et al., for photodisruptive YAG laser procedures in the posterior vitreous body. While structures in the anterior to central vitreous body may be treated with the CGPL or without any contact glasses, the safety and efficacy of the photodisruption are increased in the deeper vitreous body with the CGVL contact glass. Its magnifying effect and the facility for identifying the retina allow for improved aiming accuracy. It is made of laser-resistant glass and has antireflection coating.

Optical attributes
The CGVL vitrectomy contact glass increases the cone angle of the laser beam and therefore also the beam diameter on out-of-focus structures, while decreasing the diameter of the focal spot. The effective focal spot reduction is achieved by minimizing spherical aberrations and coma: the center of curvature of the entrance surface – a point free of spherical aberrations or coma – coincides with the center of curvature of the retina, while the other aplanatic point of the entrance surface is located on the retina.

Dioptic power in air  
-33 D

Cone angle magnification  
1–1.4x

\(^1\) Antireflection coating for visual examination and laser treatment: 450–650 nm and 1064 nm.
2.12.4 Capsulotomy contact glass CGPL

The CGPL capsulotomy contact glass was designed by Riquin, Fankhauser et al., for the dissection of opacified posterior lens capsules and membranes in the pupillary and retropupillary space with the YAG laser. This contact glass increases the safety and efficacy of laser procedures. It lowers the minimal laser energy that is necessary for disruption of the capsule, and it reduces the likelihood of IOL (intraocular lens) pitting. The magnifying effect improves aiming accuracy, which is particularly important in the presence of a lens implant. Perfect handling of the contact glass is facilitated by the large diameter. It is made of laser-resistant glass and has antireflection\(^1\) coating.

Optical attributes

The CGVL contact glass increases the cone angle of the laser beam and therefore also the beam diameter on out-of-focus structures, while decreasing the diameter of the focal spot. The effective focal spot reduction is achieved by minimizing spherical aberrations and coma through application of the Young-Weierstrass theorem: the contact glass was designed so that the aplanatic point of the entrance surface falls on the retropupillary space, eight millimeters behind the cornea.

Dioptric power in air +9 D

Cono angle magnification 1.5x

\(^1\) Antireflection coating for visual examination and laser treatment: 450–650 nm and 1064 nm.
2.12.5 Contact glass RETINA 145 L

The Retina 145 L contact glass is a panfundus wide-angle contact glass designed to facilitate the problem-free diagnosis and treatment of the retina as far as the aequator. With an image magnification of 0.7 x, this contact glass allows for a highly detailed assessment of even subtle changes in the fundus.

In summary, the Retina 145 L panfundus contact glass is universally suited for use in diagnostics and laser therapy in the area of the retina, including the aequator. Its suitability for use in the diagnostic and therapeutic area makes this contact glass ideal for almost the entire range of retinological applications.

**Optical attributes**

The quality of the laser-scan image is as high on the periphery as it is in the centre. There are no major image distortions. Simultaneous visualization of the posterior-pole and centre periphery permits optimum orientation toward the back of the eye at any time, thus minimizing the risk of undesired laser coagulations in the area of the posterior pole.

- Dioptric power in air: 86.5 D
- Magnification: –0.7x
- Field of vision: 145°
- Magnification laser spot on retina: 1.33x

---

1) Antireflection coating for visual examination and laser treatment: 450–650 nm and 1064 nm.

2.13 81 D lens
The 81 D lens is not symmetrical. It has a relatively large diameter and both sides are aspherical. Closer inspection reveals that one side of the lens features steeper curves than the other side. This shape optimizes the image-reproduction quality of the lens and also reduces the need for pupil dilation. The marking on the lens border will be discernible during use. This means that the lens is correctly positioned. The image will be that of a 78 D lens. If the lens is positioned with the more sharply-curved surface toward the patient’s cornea, the image will approximate that of a 90 D lens.

2.13.1 Preparing the patient
* The 81 D lens is also very efficient on small pupils. For this reason, pupil dilation is not necessary in most cases.
* In the event of incipient difficulties or complicated applications, pupil dilation is an ideal prerequisite for a fundus examination, however.

2.13.2 Simple fundus examination
In order to examine the patient’s fundus, the slit lamp must first be configured. Here, the binocular magnification is set to the smallest-possible level. Illumination must be set to a slit of maximum height and a width of 2 to 5 mm. The illumination intensity must be low to ensure that the examination is comfortable for the patient.
2.13.3 Positioning the patient
- The patient is to rest his head on the chin rest (d) and lean his forehead against the forehead band (a).
- The lens is to be positioned in front of the patient’s cornea (b), the steeper side facing toward the examiner.
- As the lens is guided closer (c) to the patient’s cornea, the image of the iris becomes larger until it fills the entire lens aperture.

2.13.4 Observation
- The slit lamp is placed in examination position.
- A good initial position for examination is achieved by setting the illumination slit on the lens border.
- While looking through the eyepiece, the slit lamp is to be slid toward and then away from the lens.
- It is important to ensure that the focal plane generated through the lens is positioned in the air and in front of the lens.
- The slit image of the fundus is now visible.

2.13.5 Image alignment
When the image of the fundus is produced, it will be possible to observe the patient’s entire fundus by sliding the slit lamp upwards, downwards, right or left. With slight lens manipulations, unwanted reflections may be corrected and the image may be sharpened.

2.14 D lens special applications
2.14.1 Visualisation of the optical nerve
An examination of the optical nerve is a conventional method of classifying glaucoma patients. Observing a specific optical nerve using the slit lamp is best suited when the angle between the microscope and the illumination is set to 10°. Here, the lens conveys an indirect image. Therefore, a temporal angle of 10% for the left eye and a nasal angle of 10% for the right eye must first be set.

2.14.2 Examination of the vitreous body
A wider beam than usual is necessary for an examination of the vitreous body. A wider slit is ideal with illumination that is displaced by 1° or 2° from its normal position. The examination is conducted by retracting the slit lamp lever from the previous fundus examination position, and by scanning the image field.

2.14.3 Retinal detachment
Normal microscope settings together with an additional angle setting of 1° to 4° for illumination, facilitate better observation of specific areas of the retina. The small differences in examination and illumination angle show the slit in two different locations: on the raised tissue and on the subretinal surface.

2.14.4 Macular holes
A narrow slit light width is suitable for detection of the geometric characteristics of a macular hole. The surrounding ridges can be best captured through the change in shape of the slit image.

2.15 81 D lens technical data

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<th>Parameter</th>
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<td>Focal distance</td>
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<tr>
<td>Magnification</td>
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<tr>
<td>Dipters</td>
<td>81.0 dpt</td>
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<tr>
<td>Minimal pupil</td>
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<tr>
<td>Laser point</td>
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<tr>
<td>Resolution</td>
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<tr>
<td>Coating</td>
<td>R &lt; 1 %, 450–650 nm</td>
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</tbody>
</table>

2.16 81 D lens sterilisation

**NOTE!**
The 81 D lens may be sterilised if necessary. This may only be done using ethylene oxide (ETO) gas.
- The operator accepts liability for use of other sterilisation methods.

2.16.1 81 D lens cleaning and disinfection

**NOTE!**
The 81 D lens is cleaned and disinfected in the same way as contact glasses, pursuant to the separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses and Desinset.

**PROHIBITED!**
- Disinfection with alcohol
- Cleaning with acetone
- Disinfection using UV radiation
- Sterilisation using steam or ethylene oxide
- Temperatures above 60°C

3. Technical data

See section ‘Product overview’ (chapter 2.3, page 7) and the respective product description.

**NOTE!**
Subject to technical alterations.

4. Accessories

**NOTE!**
Order numbers (HS part numbers) are in italics

Elbow supports in wood

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</tr>
</tbody>
</table>
5. **Legal regulations**
   - According to Directive 93/42/EEC on medical devices, the contact glasses are in Class I.
   - You can request a copy of the declaration of conformity for this contact glass from HAAG-STREIT at any time.
   - Statutory accident regulations are to be observed.

6. **Classification**
   - CE Directive 93/42/EEC Class I
   - FDA Class II

7. **Environment**
   - This product was made available for sale after the 13th August 2005.
   - It should be disposed of via your HAAG-STREIT representative.
   - This guarantees that no hazardous substances enter the environment and that valuable raw materials are recycled.
Should you have any further questions, please contact your HAAG-STREIT representative at:
http://www.haag-streit.com/contact/contact-your-distributor.html