

# Periscopes

Security  
provided  
by



Your specialist for acrylic  
and glass periscopes.



### **NBC resistance**

All surfaces of GuS periscope are made of NBC-resisting materials.

### **UV resistance**

UV radiation may make the window dull as time passes. The laminate system developed by GuS eliminates the problem.

### **Thermal resistance**

The use of the GuS laminate system improves the thermal resistance of the periscopes and prevents delamination of the glued layers even under extreme temperature load.

### **Laser protection**

To prevent damage caused by laser beams, all glass and acrylic periscopes can be equipped with GuS laser protection filters that are available for a wide range of wavelengths and protection levels.

### **Bulletproofness**

GuS periscopes are bulletproof against 7.62 mm x 51 AP at angles of impact between 90° and 30°, some up to 14.5 mm x 114 API.

# Periscopes

As a periscope specialist, we supply acrylic and glass variants optimised for the needs of our customers and made to international standards.

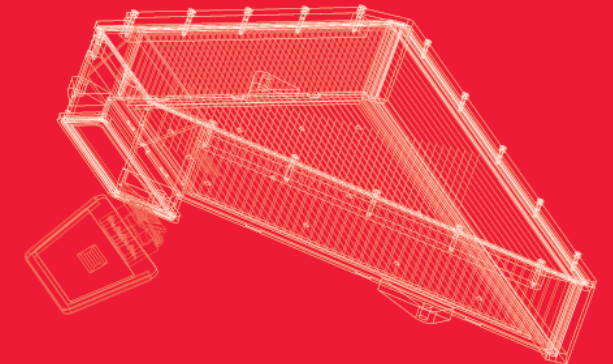


We develop, make and qualify acrylic and glass periscopes based on standards such as the German technical terms of delivery (TL) and US army MIL-DTL-62420 B(AT). Compliance with the standards is continuously checked on site at GuS by the quality inspection office of the German armed forces. Naturally, our customers' specifications for periscopes vary considerably, e.g. with regard to the size of the field of vision or the interface dimensions.

We can flexibly adapt to any need. Select from the range of functions and system features that are suitable for either „normal“ or „special“ requirements.

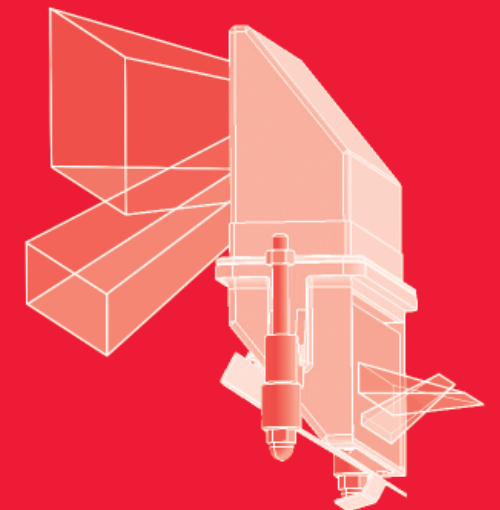
### **Periscope folding systems**

The use of periscope folding systems is necessary where space is limited in a vehicle.



### **Second field of vision**

A special design of the optical paths inside the periscope allows the addition of a second field of vision.



# Acrylic

Resolution	< 2'
Spherical Power	+/- 0,3 diop
Astigmatism	0,2 diop.
Opt. Transmission	> 40 %
Opt. Density	OD 5
Angular Deviation	+/- 30'
Inclusions	3 x 0,63
Chemicals	Fulfilled
High temperature	> 71°C
Low temperature	- < 54 °C
Humidity	71°C / 95 % r.H.
Salt fog	Fulfilled
Vibration	Fulfilled
Shock	Fulfilled
Tightness	Fulfilled
Fungus	Fulfilled
Solar Radiation UV	No damage in UV testing
Protection against bombardment	Passed test bombardment
Life time	10 years
Warranty	1 year
Decontamination	Yes
Weight	7,3 kg
Maintenance	Yes
Costs of maintenance	Ca. 60 %

Due to the improvements we have developed in the field of UV and thermal resistance and the option of combining various laser protection types and other applications, acrylic periscopes made by GuS have the best price-performance ratio.

# Acrylic or glass



GuS is the sole supplier to the German armed forces and sells to almost all European NATO members. More than 100 different periscope types are installed in all German and a large number of other European and US combat vehicles. There are good reasons for these references, namely, our quality

that the German armed forces and ourselves put to the test again and again and the large share of internal production that allows us to reliably meet even short delivery deadlines.

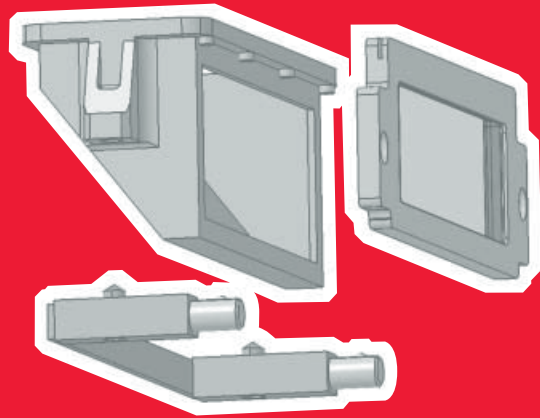
# Glass

Resolution	< 1'
Spherical Power	+/- 0,1 diop.
Astigmatism	0,1 diop.
Opt. Transmission	> 45 %
Opt. Density	OD 5
Angular Deviation	+/- 20'
Inclusions	3 x 0,5
Chemicals	Fulfilled
High temperature	> 71°C
Low temperature	< -54°C
Humidity	71°C / 95 % r.H.
Salt fog	Fulfilled
Vibration	Fulfilled
Shock	Fulfilled
Tightness	Fulfilled
Fungus	Fulfilled
Solar Radiation UV	No damage in UV testing
Protection against bombardment	Passed test bombardment
Life time	10 years as with acrylic
Warranty	1 year
Decontamination	Possible
Weight	15 kg
Maintenance	Possible
Costs of maintenance	Approx. 75% of price as-new

The optical characteristics of glass periscopes are partly superior to those of acrylic periscopes. Since you can purchase a glass version of any acrylic periscope made by us including all conceivable combinations of laser protection and other applications, the choice of material is yours.

## Retrofittable laser protection

Vehicles are often used in the most varied crisis zones and the requirements made on a periscope change with the threat. In particular, laser protection needs to be adjusted to the actual conditions on site. Our laser filter system enables variable retrofitting of laser protection filters in battle.



Laser protection for all the wavelengths specified here can be integrated in the periscope and also retrofitted.

### Standard GuS laser filters:

Wavelength	O.D.	laser type
532 nm	3.4	pulse + CW
694 +/- 5 nm	3.4	pulse + CW
840 to 905 nm	4.0	pulse + CW
905 to 1064 nm	5.0	pulse + CW
1064 to 1100	6.0	pulse + CW

# Laser protection filters



As we manufacture all laser protection filters ourselves (mainly for use in periscopes and armoured glass), your choice is extremely wide in three categories:

- 1-line laser protection filters that consist of a laser-beam-absorbing glass substrate
- 2-line laser protection filters in which the laser-beam-absorbing glass substrate is coated with a multilayer interference filter (hybrid laser protection filter)

- 3-line laser protection filters in which the laser-beam-absorbing glass substrate is coated with two multilayer interference filters or consists of a combination of laser-beam-absorbing plastic layers, laser-beam-absorbing glass substrates and multilayer interference filters

## Integrated laser protection

The integrated laser protection is a laser protection system which is built into the device and cannot be removed or replaced.



The advantage of the integrated laser protection is that the periscope is always equipped with a basic protection that can be supplemented by the retrofittable laser protection at any time.

### For all laser types

Various laser types are used for military purposes which all have different characteristics (wavelengths) and require individual laser protection filters. Typical laser types include:

- Nd: YAG-laser 1064 nm
- Ruby laser 694 nm
- Diode laser 840 nm to 905 nm
- Nd: Double YAG Laser 532 nm

## Window heating

Main battle tanks and armoured fighting vehicles need to be as mobile as possible and able to operate anywhere in the world regardless of climatic conditions. Heating keeps windows ice-free and prevents fogging for a clear view also if night-vision equipment is used.



The heating elements are made by us and can be designed for your desired heating power.

# Accessories

- Shutters and protective caps
- Window heating
- Transport and storage containers
- Lamellar seals



## Shutters and protective caps

... are available for the most varied types of periscopes.

## Window heating

... ensures clear view if the air inside the vehicle is moist or outside air humidity condensates on the panes in winter.

## Transport and storage containers

... made of special plastic protect expensive and sensitive equipment.

## Lamellar seals

... have considerably better sealing properties compared to the standard sealings of some periscopes.

## Shutters and protective caps

Protective caps for periscopes are used to prevent head injuries to crew members, in particular off road. Shutters prevent light from exiting the vehicle, e.g. at night.



We can manufacture tailor-made protective caps.



**Used all over the world.**  
**Vehicles use GuS periscopes**  
**in the following countries:**

- Austria
- Australia
- Canada
- Finland
- Germany
- Great Britain

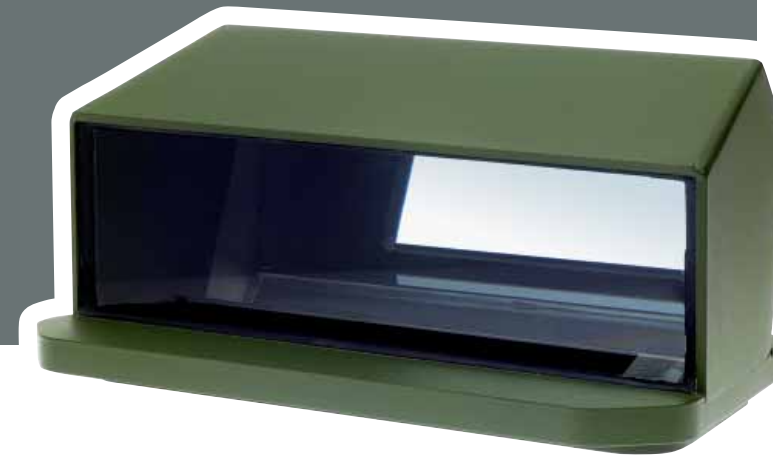


- Greece
- Italy
- Netherlands
- Norway
- Poland
- Spain
- Sweden
- Switzerland
- Turkey

# Made to specifications.

Our customers in particular appreciate that we develop solutions consistently under one umbrella, manufacture most of the components used in our products in-house and supply complete systems readily assembled as required. So, we never leave quality to chance but to the responsibility of our own experienced and highly qualified staff. International military standards and individual solutions go hand in hand –

from the catalogue product to the complete module the specifications of which in many cases are developed jointly with our customer.



## Standardised and of reliable quality.

Ever since we started our company, we have produced in accordance with NATO quality standard AQAP4 130. Since 1997, we have applied quality standard DIN EN ISO 9001 and at the moment, we are manufacturing in accordance with DIN EN ISO 9001/2000. Our quality assurance system is based on many years' experience with US army MIL specifications, the German technical terms of delivery (TL) and customer-specific requirements. We have all equipment for testing periscopes based on these specifications available at our plant.

**Fax to GuS:**  
**+49 (0)5741/9003 90**

**I would like further information material about:**

- Composite Armor**
- Transparent Armor**

**Please telephone me.**

\_\_\_\_\_  
 Name

\_\_\_\_\_  
 Company

\_\_\_\_\_  
 Department

\_\_\_\_\_  
 Street

\_\_\_\_\_  
 Town, postcode

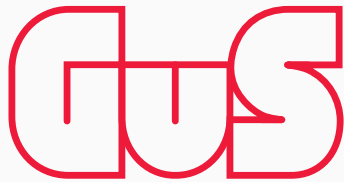
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