

Process observation and visual control systems

Lumiglas

Sterile Technology



Quelle: Bayer AG

Sight glass fittings with integrated lighting for aseptic and sterile environments in the biotechnology, pharmaceutical, food processing and chemical industries

PAPENMEIER

Lumiglas

Aseptic or sterile processes make particularly high demands on the hygienic properties of bio and pharmaceutical products.

Special requirements must also be met by the fittings used in processing plant in order to minimise the harmful effect of spores or fine particulate residues. Undesirable bacterial growth must be effectively prevented.

The sterile conditions that are essential in the manufacture of insulin are a typical example. Contamination of the end product by impurities can only be prevented by taking measures that ensure maximum cleanliness and sterility.

To warrant compliance with increasingly rigid standards – particularly in biotechnology and pharmaceutical operations – Lumiglas have now developed a special range of products: **'Lumiglas Sterile Technology'**.

All sight glass fittings and luminaires in this Lumiglas line meet the requirements of clean-room and aseptic technology.

Reactors, apparatus, containers and pipework in the field of sterile technology are designed in such a way that they can be cleaned at their place of installation without any residues.

Under no circumstances should there be any chance of unwanted bacterial growth, for instance. In addition to appropriate vessel construction materials (stainless steel, glass), special seals are crucial in clean-room applications. The interiors of vessels and pipelines are particularly critical. It is essential to meet the following high demands:

- High corrosion resistance of materials
- Extremely smooth surface finish
- Nothing that could cause dead spaces
- No gaps or chinks
- Reactor interiors must be hermetically sealed off from the environment

The choice of components and materials is determined by the substances to be processed in the reactor. All surfaces that come in contact with the product must be absolutely smooth. The roughness value (Ra) of product contact surfaces should not exceed an average 0.8 µm.

Special processes have been developed to meet these requirements, such as fused metal-glass (METAGLAS®) which has a continuous smooth surface (Ra 0.25 µm) on the product contact side. Other fitting variants feature a seal between the glass and the metal using special gaskets and seating profiles so that, when correctly installed, there is no chance of dead spaces or chinks.

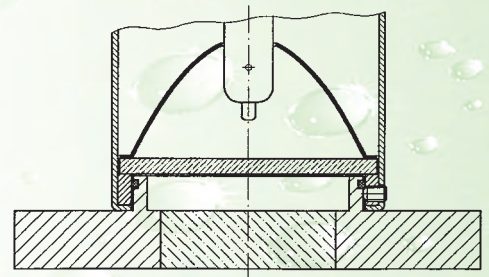
The screwed, flanged or clamped connections generally used in process and chemical engineering are also accepted for aseptic applications provided the internal surfaces have seamless joints.

Sterile sight glass fittings can be used as sight ports or combined with Lumistar luminaires as light ports.

An excellent seal and fittings system for use in sterile areas is available from Neumo who, among other things, have developed the **BioControl** range of products. Lumistar luminaires have been adapted accordingly.

The external areas of a reactor also have to be of corrosion resistant materials with smooth surfaces. Sight glass luminaires from the Lumiglas sterile technology range fulfil these requirements as well:

- Material: stainless steel (up to 1.4404)
- Smooth surface finish (electro-polished)
- The luminaire is located on a special raised lip of the cover flange and secured there. It is sealed off from the light glass by means of an inlaid O-ring (see illustration).



One of the particular advantages offered by luminaires in the Lumiglas sterile technology range is the fastening method:

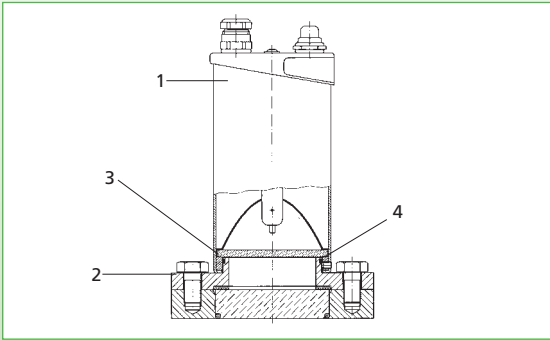
The luminaires are mounted on a raised lip on the cover flange. They are thus ideal for use with fittings for aseptic conditions, such as Bio-Control, or units which incorporate METAGLAS®, i. e. fused metal/glass sight glasses. METAGLAS® functions very successfully with clamped connections (META-CLAMP®) and in NA-Connect™ applications.

Lumistar luminaires for use in the field of sterile technology, including applications in potentially explosive environments, are available in various sizes and light outputs:

Sterile technology

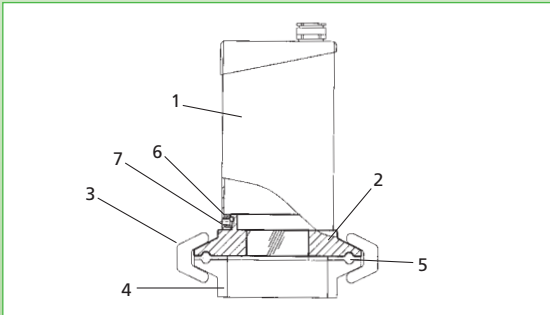
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|  | <p>Lumistar mini-luminaire, stainless steel, USL 31 Outside dia.: 24 mm; Light exit dia.: 14 mm Halogen lamp: 12 V/5 W or 24 V/20 W</p> |
|  | <p>Lumistar luminaires USL 33 and USL 33-LED, stainless steel Outside diameter: 53 mm; Light exit dia.: 43 mm Halogen lamp: 12 V, 24 V, 120 V; 20 W or 50 W LED lamp: 12 V/24 V, approx. 2 W</p> |
|  | <p>Lumistar luminaires USL 35 and USL 35-LED, stainless steel Outside diameter: 70 mm; Light exit diameter: 60 mm Halogen lamp: 12 V, 24 V, 120 V, 230 V; 20 W, 50 W, 100 W LED lamp: 12 V/24 V, approx. 4 W, 230 V approx. 7 W</p> |
|  | <p>Lumistar luminaires USL 36 and USL 36-LED, stainless steel Outside diameter: 74 mm; Light exit diameter: 56 mm Halogen lamp: 12 V, 24 V, 120 V, 230 V; 20 W, 50 W, 100 W LED lamp: 12 V/24 V, approx. 4 W; 120 V, approx. 9 W; 230 V, approx. 7 W</p> |
|   | <p>Lumistar luminaires ESL 25 and ESL 25-Ex, stainless steel Ex variant designed for applications in potentially explosive environments, Zones 1 and 2, Zones 21 and 22 Outside diameter: 71 mm, Light exit diameter: 43 mm Halogen lamp: 12 V, 24 V, 120 V, 230 V; 5 W, 10 W, 20 W Depending on output, up to temperature class T6/T80°C</p> |
|   | <p>Lumistar luminaires ESL 27 and ESL 27-Ex, stainless steel Ex variant designed for applications in potentially explosive environments, Zones 1 and 2, Zones 21 and 22 Outside diameter: 120 mm, Light exit diameter: 90 mm Halogen lamp: 12 V, 24 V, 120 V, 230 V, 240 V; 20 W, 35 W, 50 W Depending on output, up to temperature class T6/T80°C</p> |
|   | <p>Lumistar luminaires ESL 55-LED and ESL 55-LED-Ex, stainless steel Ex variant designed for applications in potentially explosive environments, Zones 1 and 2, Zones 21 and 22 Outside dia.: 78 mm, Light exit diameter: 45 mm 12 V, 24 V, 120-230 V; AC/DC, 11 W and 15 W With 3 or 6 high-output LED, temperature class T6/T80°C</p> |

Installation examples for Lumistar luminaires, stainless steel:



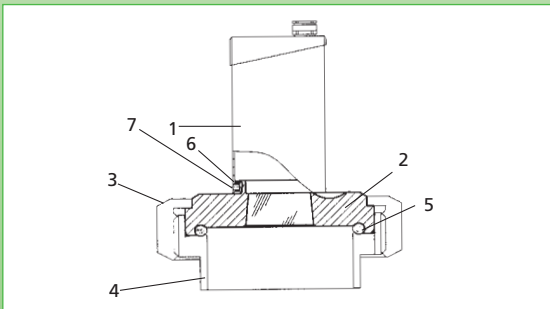
Application on a BioControl sight glass fitting

- 1 Lumistar luminaire
- 2 BioControl cover flange with inner lip
- 3 O-ring seal, luminaire/sight glass unit
- 4 Locking screws



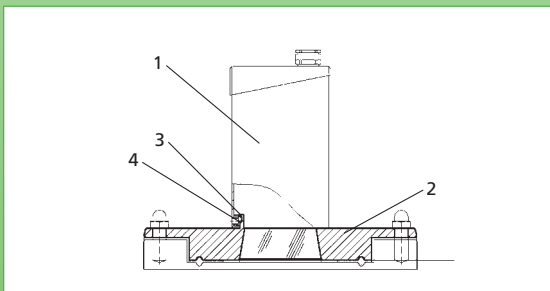
Application on a fused glass-metal sight glass for clamped connections (META CLAMP®)

- for clamped connector acc. to DIN 32676/ISO 2852
- 1 Lumistar luminaire
 - 2 METAGLAS® sight glass disk with integrated flange
 - 3 Clamp
 - 4 Welded clamp connector
 - 5 Seal
 - 6 O-ring seal, luminaire/sight glass unit
 - 7 Locking screws



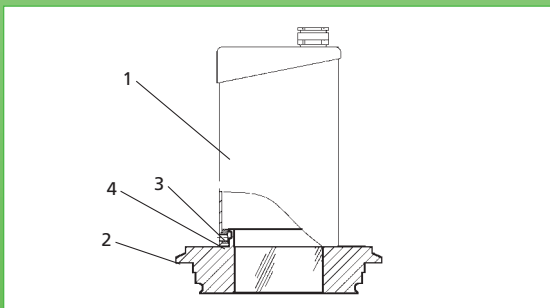
Application with fused glass-metal sight glass disk for screwed sight glass fittings for aseptic environments - DIN 11864

- 1 Lumistar luminaire
- 2 METAGLAS® sight glass disk with integrated flange
- 3 Locknut
- 4 Welded connector
- 5 O-ring seal, fitting
- 6 O-ring seal, luminaire/sight glass unit
- 7 Locking screws for luminaire



Application with fused glass-metal sight glass for NA-Connect® joints

- 1 Lumistar luminaire
- 2 Cover flange with METAGLAS® sight glass disk
- 3 O-ring seal, luminaire/sight glass unit
- 4 Locking screws



Application with fused metal-glass sight glass for VARIVENT® in-line enclosures

- 1 Lumistar luminaire
- 2 Cover flange with METAGLAS® sight glass disk with integrated flange
- 3 O-ring seal, luminaire/sight glass unit
- 4 Locking screws