**Process Lighting in the fields
of Aseptic and Sterile Technology**

Lumiglas
Product overview

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Aseptic or sterile processes make exceptional demands on the hygienic properties of organic and pharmaceutical products.

Special requirements also have to be met by the fittings used in the plant in order to avoid the harmful influences of spores and particulate residues. It is vital to effectively prevent unwanted bacterial growth.

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 stipulations – particularly in biotechnical and pharmaceutical operations – Lumiglas have now developed a special range of products for sterile technology applications.

All the sight glass fittings and luminaires in this Lumiglas product line meet the requirements of aseptic and sterile technology.

Reactors, apparatus, tanks 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, for instance, unwanted bacterial growth.

These requirements must be met:
- **High corrosion resistance of materials**
- **Extremely smooth surfaces**
- **Nothing that causes dead spaces**
- **No gaps or chinks**
- **Reactor interiors must be hermetically sealed off from the environment**

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

Special processes have been developed to meet these requirments, such as fused metal-glass (METAGLAS®) for sight glasses with a uniform, smooth surface (Ra 0.25 µm) in the

product contact area. With other fitting variants the seal between the glass and the metal is established using a specific lead-in with special gaskets so that dead spaces or gaps can be ruled out if installation has been carried out properly.

The screwed, flanged or clamped connections generally used in process engineering are also accepted for aseptic applications, provided the internal surfaces have seamless joints. An excellent seal and fitting system is available from Neumo who have developed the BioControl range of products. Lumistar luminaires have been adapted accordingly.

Corrosion resistant materials with smooth surfaces are mandatory in the external areas of a reactor as well. The Lumiglas range of sterile technology luminaires also meet the following specifications:
- Material: stainless steel (up to 1.4404)
- Smooth surfaces (electro-polished)
- The luminaire is positioned on a special raised lip of the cover flange and secured there. It is sealed off from the sight glass by means of an inlaid O-ring.

Lumistar luminaires for aseptic and sterile technology are available in various sizes and light outputs – for applications in potentially explosive environments as well:

Mini Lumistar luminaire USL 31, stainless steel
- For general applications with hinged bracket or clamped flange mounting
- Outside diameter: 24 mm
- Light exit dia.: 14 mm
- Halogen lamp: 12 V/5 W or 24 V/20 W

Lumistar luminaire ESL 51-LED, stainless steel
- Special version for sterile applications, flange mounting for attaching to a flange or lip, or as a clip variant for mounting on Lumiglas sight glass wiper SW 1
- Outside diameter: 35 mm
- Light exit dia.: 23.5 mm
- LED lamps: 24 V; c. 2.5 W

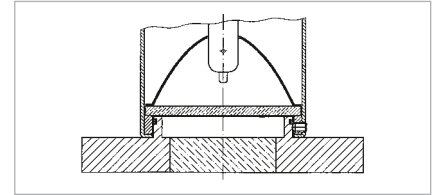**Lumistar luminaires USL 33 and USL 33-LED, stainless steel**
- Special version for sterile applications, flange mounting for attaching to a flange, lip, etc.
- Outside diameter: 53 mm
- Light exit dia.: 43 mm
- Halogen lamp: 12 V, 24 V, 120 V; 20 W or 50 W
- LED lamps: 12 V, 24 V; c. 2 W

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Ideal mounting for the Lumistar luminaire in sterile environments:
The Lumistar luminaire is fitted over a raised lip on the cover flange. As a result, it is optimally adapted to fittings for aseptic and BioControl applications or for configurations in which fused glass-metal (META-GLAS®) sight glasses are used.

METAGLAS® functions well with clamped joints (METACLAMP®) and in NA-Connect® environments.

Lumistar luminaire ESL 53-LED, stainless steel
- Special version for sterile applications, flange mounting for attaching to a flange or lip, or as a variant with hinged bracket
- Outside diameter: 53 mm
- Light exit dia.: 43 mm
- LED lamp: 24 V, c. 7 W

Lumistar luminaires USL 35 and USL 35-LED, stainless steel
- Special version for sterile applications, flange mounting for attaching to a flange, lip, etc.
- Outside diameter: 70 mm
- Light exit dia.: 60 mm
- Halogen lamp: 12 V, 24 V, 120 V, 230 V; 20 W, 50 W, 100 W
- LED lamp: 12 V/24 V, c. 4 W; 230 V, c. 7 W

Lumistar luminaires USL 36 and USL 36-LED, stainless steel
- Special version for sterile applications, flange mounting for attaching to a flange or lip, or as a variant with hinged bracket
- Outside diameter: 74 mm
- Light exit dia.: 56 mm
- Halogen lamp: 12 V, 24 V, 120 V, 230 V; 20 W, 50 W, 100 W
- LED lamp: 12 V/24 V, c. 4 W; 230 V, c. 7 W

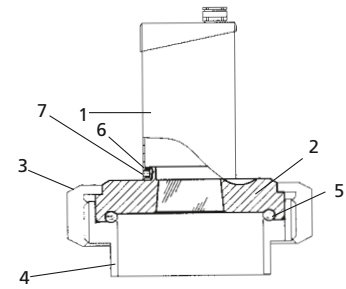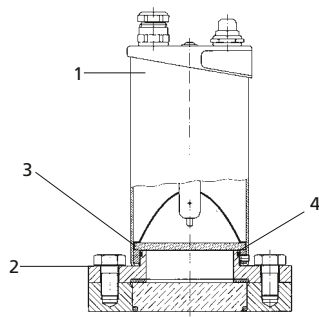**Lumistar luminaires ESL 25 and ESL 25-Ex, stainless steel**
- Version for applications in potentially explosive environments: Zones 1 and 2, Zones 21 and 22
- Special version for sterile applications, flange mounting for attaching to a flange, lip, etc.
- Outside diameter: 71 mm
- Light exit dia.: 43 mm
- Halogen lamp: 12 V, 24 V, 120 V, 230 V; 5 W, 10 W, 20 W
- LED lamps: 24 V, 120-230 V, c. 7.5 W
- Up to temperature class: T6/T80°C, depending on output

Lumistar luminaires ESL 27 and ESL 27-Ex, stainless steel
- Version for applications in potentially explosive environments: Zones 1 and 2, Zones 21 and 22
- Special version for sterile applications, flange mounting for attaching to a flange, lip, etc.
- Outside diameter: 120 mm
- Light exit dia.: 90 mm
- Halogen lamp: 12 V, 24 V, 120 V, 230 V, 240 V; 20 W, 35 W, 50 W
- Up to temperature class: T6/T80°C, depending on output

Lumistar luminaires ESL 55-LED and ESL 55-LED-Ex, stainless steel
- LED version for sterile applications potentially explosive environments: Zones 1 and 2, Zones 21 and 22
- Special version for sterile technology for attaching to a flange or as a variant with hinged bracket
- Outside diameter: 78 mm
- Light exit dia.: 45 mm
- LED lamps with 3 or 6 high-power LEDs: 24 V, 120-230 V; 11 W and 15 W
- Temperature class: T6/T80°C

Solutions for aseptic and sterile applications

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Sight glass fittings for sterile technology can be used as sight glasses or as light glasses in combination with Lumistar luminaires.
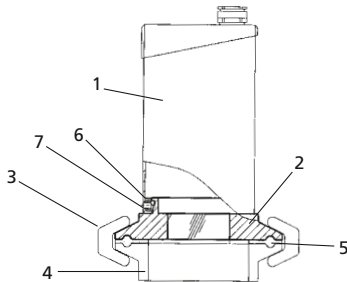
Here are some examples for mounting Lumistar luminaires in a sterile environment:

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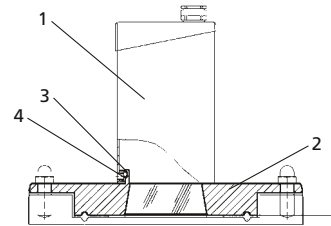3 O-ring seal luminaire/sight glass unit
4 Locking screws

Application with fused glass-metal sight glass disc for aseptic screw-type sight glass fittings to DIN 11864
1 Lumistar luminaire
2 METAGLAS® sight glass disc with integrated flange
3 Lock-nut
4 Weld-on connecting piece
5 O-ring seal, fitting
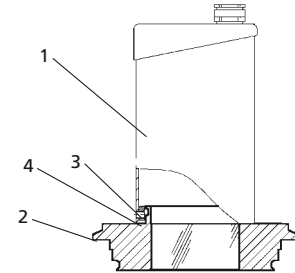6 O-ring seal luminaire/sight glass unit
7 Locking screws

Application on a fused metal-glass sight glass for clamped joints (METACLAMP®) for clamped connection pieces to DIN 32676/ISO 2852
1 Lumistar luminaire
2 METAGLAS® sight glass disc with integrated flange
3 Clamp
4 Welded clamp connection piece
5 Gasket
6 O-ring seal luminaire/sight glass unitt
7 Locking screws

Application with fused metal-glass sight glass for NA-Connect® joints
1 Lumistar luminaire
2 Cover flange with METAGLAS® sight glass disc
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 disc with integrated flange
3 O-ring seal luminaire/sight glass unit
4 Locking screws