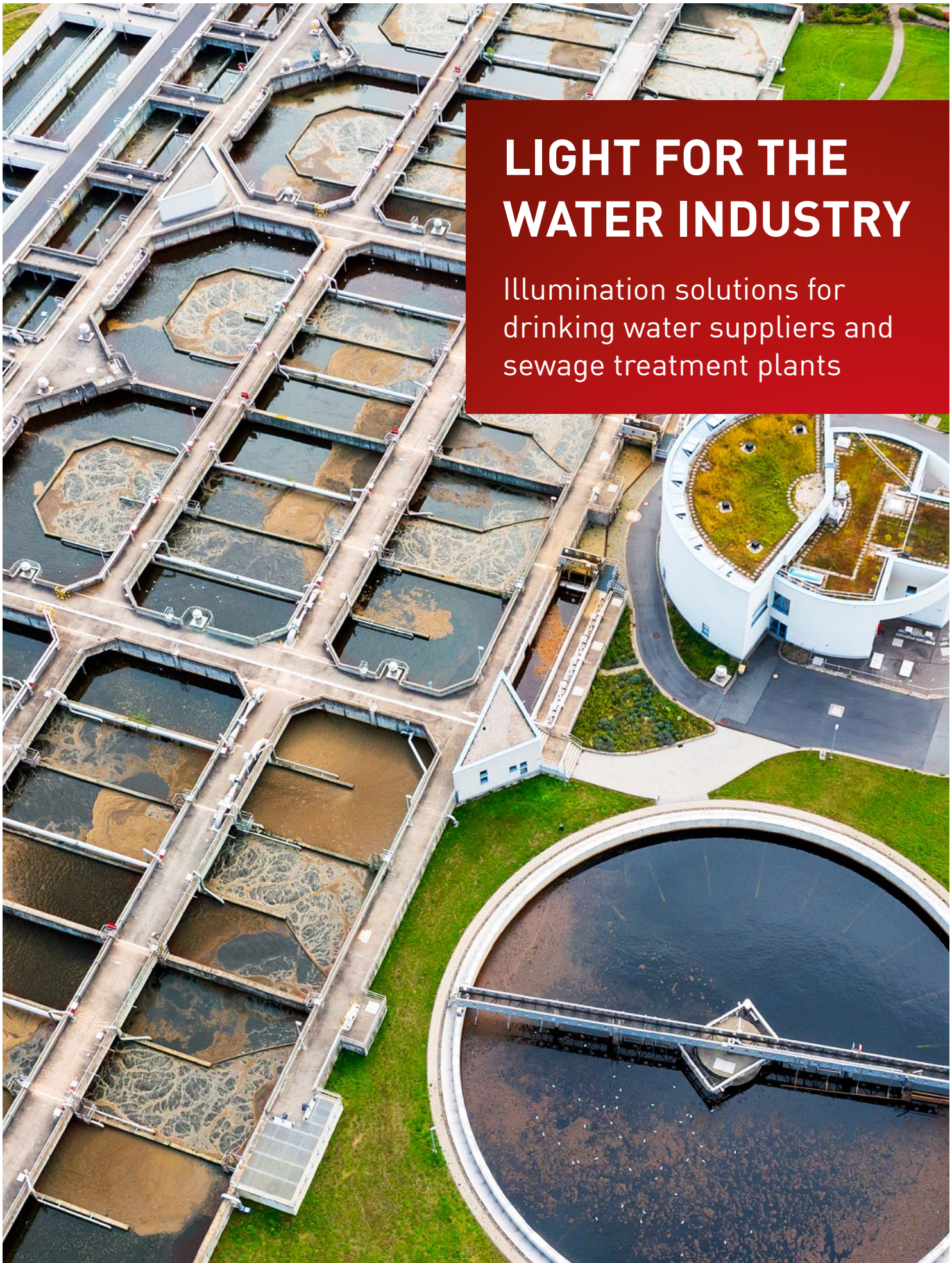
NORKA



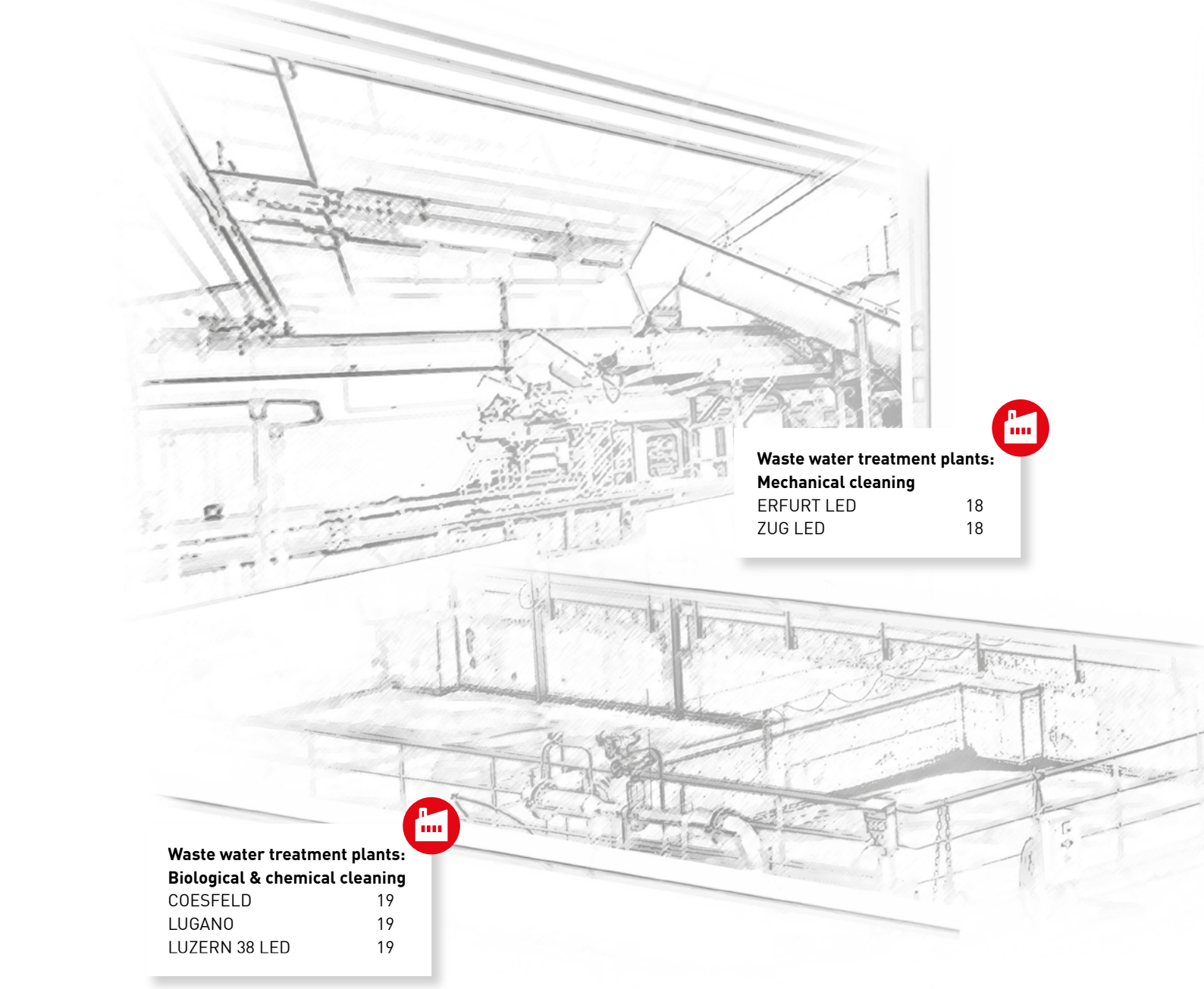
LIGHT FOR THE WATER INDUSTRY

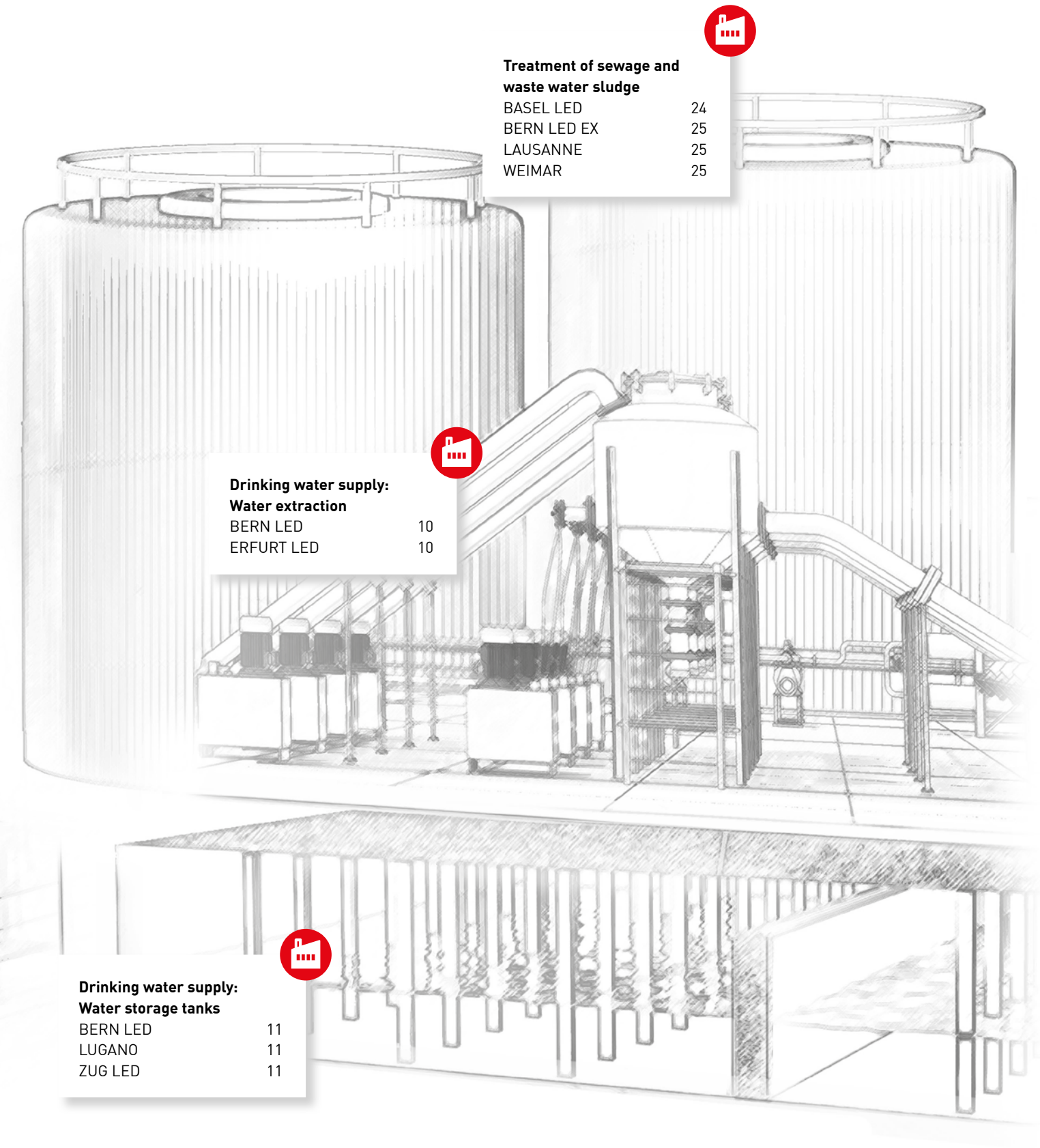
Illumination solutions for drinking water suppliers and sewage treatment plants

LIGHT FOR THE WATER INDUSTRY

Local and municipal facilities such as waste water treatment plants and water suppliers, as well as independent water treatment plants, are exposed to extreme environmental conditions in terms of constant moisture and corrosion when lighting their industrial facilities. In this context, it is important to invest in reliable, long-lasting and efficient luminaires that can withstand different requirements.

SOLUTIONS FOR WATER SUPPLIERS AND WASTE WATER TREATMENT PLANTS





Treatment of sewage and waste water sludge

BASEL LED	24
BERN LED EX	25
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WEIMAR	25

Drinking water supply: Water extraction

BERN LED	10
ERFURT LED	10

Drinking water supply: Water storage tanks

BERN LED	11
LUGANO	11
ZUG LED	11

USE IN MOISTURE AND DUST

IP protection ratings

The IP (ingress protection) rating provides information about the degree to which a luminaire is protected against dust and water. The first digit stands for the protection of the luminaire against contact and foreign bodies, such as dust, whilst the second digit designates the extent of protection against water.

NORKA luminaires mostly offer protection against the penetration of water jets (IP 65) at least; luminaires with protection rating IP 69K are suitable for cleaning with high-pressure or steam jets. Important to know: protection rating IP 69K does not automatically include lower protection ratings such as IP 68; these protection ratings are specified separately.

EXAMPLE OF IP 69K REQUIREMENT – ACCORDING TO DIN EN 60529

Ingress protection for protection against accidental contact and foreign bodies

1st index	Protection type Designation	Explanation
6	Dust-proof	Total protection against contact with live or internal, moving parts. Protection against dust ingress.

Ingress protection for water protection

2nd index	Protection type Designation	Explanation
9 K	Protection against water ingress during high-pressure/ steam jet cleaning	Hot water (80 °C) impacting from any direction under high pressure (80–100 bar) on the luminaire must not enter.

AT A GLANCE: IK CLASSES

Areas such as access routes, underpasses, intermediate levels and stairwells are used by a large number of people every day. However, these areas are exposed to vandalism, especially at night.
But it's not only deliberate destruction that can cause luminaires to fail – heavy or large components are sometimes handled in workshops or work pits. This is where the lighting can be unintentionally damaged and lose its function.

The specified IK class provides information about the impact resistance of luminaires. A high IK class such as IK10 and higher protects the inner workings of the luminaires from damage. The impact resistance test is carried out on the basis of DIN EN 62262. Various test weights are used to test the resistance of the lights and determine the IK class. These range from class IK 01 with an impact energy of 0.14 joules to class IK 11+ for a test with up to 150 joules.

For watertightness in accordance with DIN EN 60529, our luminaires are tested with a water pressure of 100 bar and a water temperature of 80 °C.

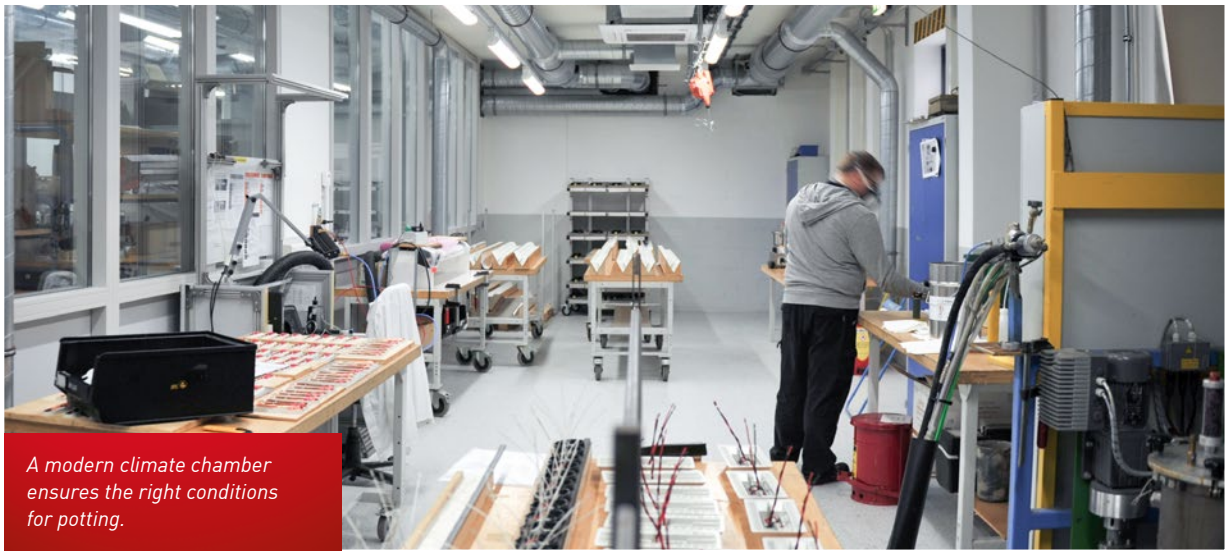
SOME ENVI-RONMENTS REQUIRE PARTICULAR DEDICATION

WHEN IP PROTECTION RATINGS ARE NO LONGER SUFFICIENT

NORKA luminaires mostly have IP protection rating 65 as a minimum, but they often also excel with higher protection ratings such as IP 68 or IP 69K. Despite the high resistance of luminaires with a protection rating up to IP 69K, there are situations where these standards are not sufficient. Water or dirt can penetrate over the long term, especially in environments with extreme chemical stress, high mechanical stress or heavy condensation.

Potting provides additional safety here, as critical areas are additionally protected. This ensures complete protection against water, dust or chemical substances. Mould-sealed luminaires are particularly long-lasting and are used in extreme applications such as drinking water tanks.

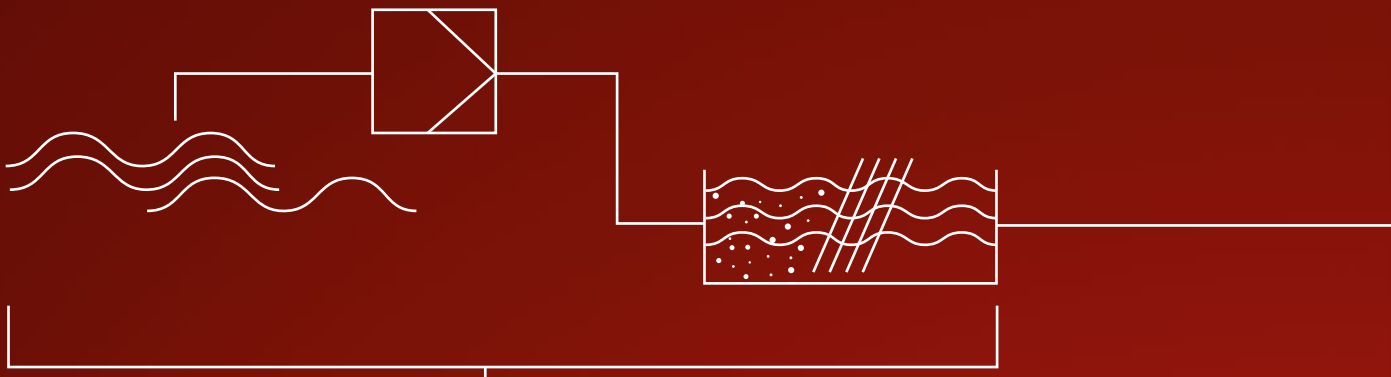
For these particularly hard cases, NORKA offers potting for protection against high humidity, dirt, dust or chemicals.



A modern climate chamber ensures the right conditions for potting.

FOR PUMPS AND STORAGE TANKS

High hygiene standards are essential in the handling of drinking water in order to deliver impeccable quality to the consumer. Regular cleaning is therefore mandatory. The transport and storage areas are also exposed to high humidity. Luminaires for this area should have excellent seal tightness in order to be low-maintenance and long-lasting in use.



Water extraction and treatment

IP 65 | IP 66 | IP 67 | IP 68 20m | IP 69K | IK 10 PC | IK 10 PMMA

BERN LED

- tubular luminaire resistant to pressurised water
- resistant to a wide range of chemicals
- optional potting for supply cables for increased seal tightness
- suitable for water extraction and treatment areas such as pump stations or screening plants

IP 65 | IK 04 PMMA | IK 09 PC

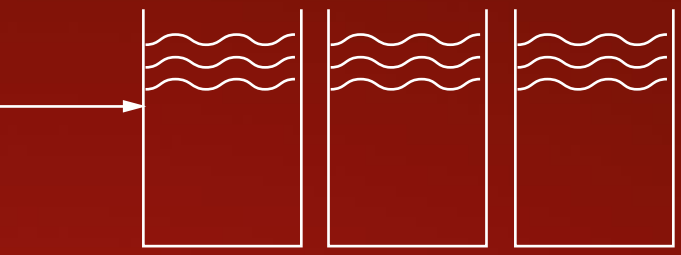
ERFURT LED

- jet water and dust proof
- with easy eXchange
- suitable for access routes, maintenance gangways and for water extraction and treatment areas such as pump stations or screening plants

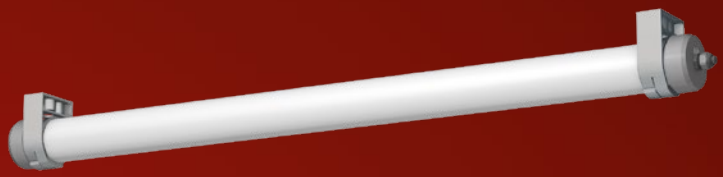
IP 65 | IP 66 | IP 67 | IP 68 20m | IP 69K | IK 10 PC | IK 10 PMMA

BERN LED

> tubular luminaire resistant to pressurised water
> resistant to a wide range of chemicals
> optional potting for supply cables for increased seal tightness
> suitable for water tanks and areas with high humidity



Water storage tanks



IP 65 | IP 66 | IP 67 | IP 68 20m | IP 69K | IK 09 PMMA

LUGANO

> gas-tight tubular luminaire
> resistant to a wide range of chemicals
> potted end caps for increased seal tightness
> suitable for water tanks and areas with high humidity

IP 65 | IP 66 | IP 67 | IP 68 20m | IP 69K | IK 09 PMMA | IK 10 PC

ZUG LED

> tubular luminaire resistant to pressurised water
> resistant to a wide range of chemicals
> optional potting for supply cables for increased seal tightness
> suitable for water tanks and areas with high humidity

PERFECT ILLUMINATION IN HIGH HUMIDITY

In drinking water storage tanks, the combination of high humidity and a low ambient temperature is a challenge.

The requirements for luminaires and lighting technology are quite special in water storage tanks: High humidity, fluctuating temperatures and few mounting points are the challenges.

Every year, consumers and companies in Germany are supplied with 5.3 billion cubic metres of drinking water by water utility companies. Drinking water is a precious commodity and a food – storage must be safe and hygienic. To ensure that fresh water is always available, the water is stored in tanks for a short period of time after treatment. This is also the case in the underground water storage tank presented here.

LIGHTING CONCEPT IN THE WATER STORAGE TANK

Without daylight, good lighting is the basis for maintaining this type of storage tank. A very good view of the entire tank is necessary for the control of the facility and for regular cleaning.

The lighting is routed from a central aisle that runs between the chambers along the entire length of the storage tank. The individual tanks lead from the central aisle to a spatial depth of about 30 metres.

The ZUG LED luminaires with their lens-type appearance and an emergency luminaire with a tube consisting of clear PMMA and potting are precisely adapted to the conditions in the water storage tank.

For maintenance purposes, the luminaires had to be installed in such a way that they could be accessed from the central aisle. The consequence: 30 metres of spatial depth must be illuminated from a lighting point. In order to achieve optimum illumination of the entire tanks, 15 of the ZUG LED m600 luminaires with their lens-type appearance were used. This LED lighting for water storage tanks is specially tailored to the requirements of these environments. The special design – with lenses specifically selected for the project – allows very good illumination of the wide and deep tanks.

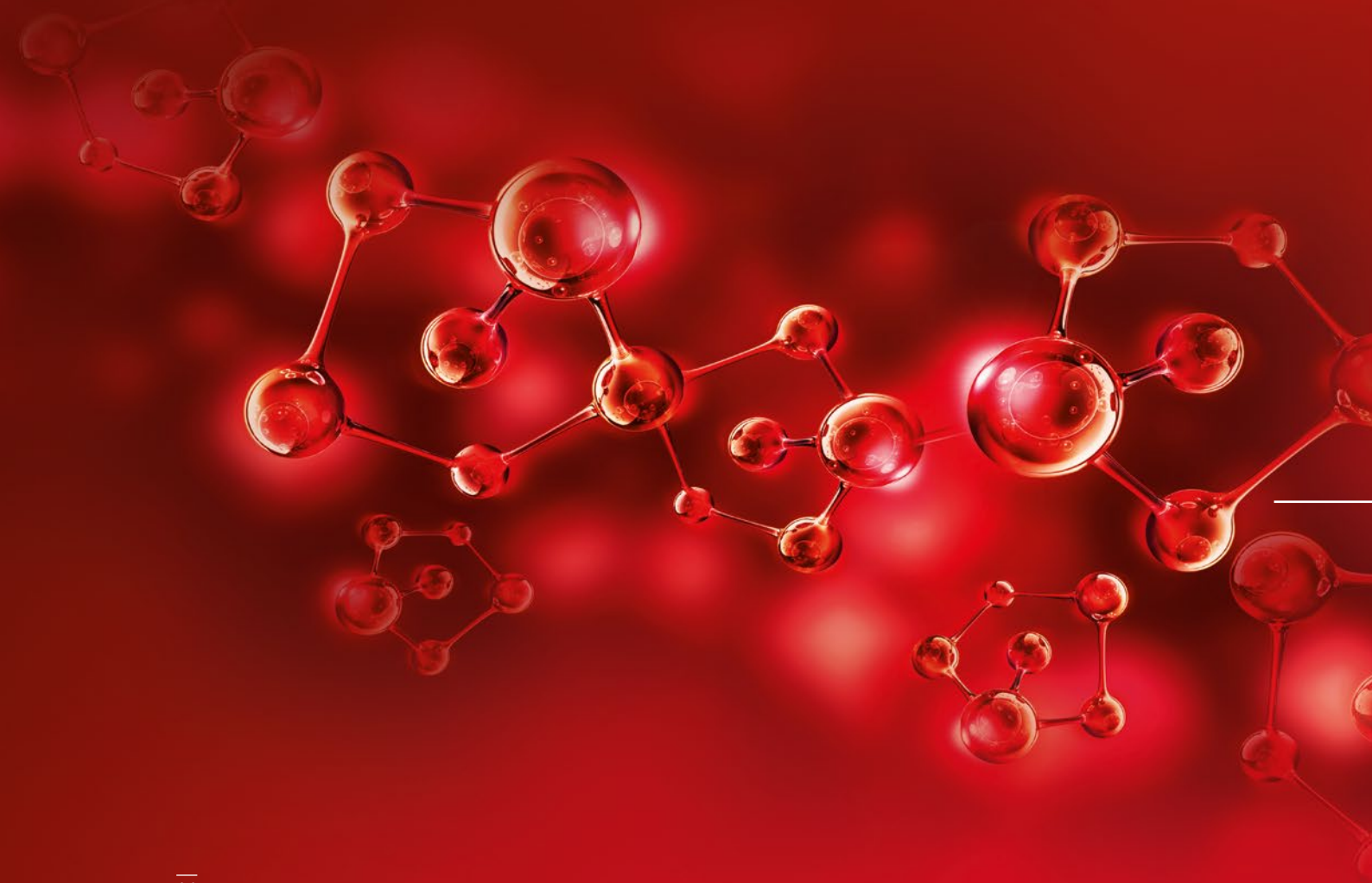
ENVIRONMENTAL CHALLENGES

In the underground storage tanks, the ambient temperature is around 15°C all year round, and the humidity is 100%. An environmental situation that has its own challenges. The switching on and off of the luminaires and the associated temperature fluctuations in the luminaire housing can lead to pressure fluctuations in the interior. As they cool down, the humidity from the environment is regularly drawn into the housing. This phenomenon makes it absolutely necessary for LED lighting for water storage tanks to have excellent seal tightness. This physical challenge was solved with an additional potting for the connecting cable, which protects the luminaires against moisture and corrosion.

SUMMARY

Due to the specific environmental conditions, the lighting of water storage tanks places high demands on the technology. With the ZUG LED m600 and its lens-type appearance, a solution has been created that ensures optimum illumination and ease of maintenance. At the same time, the luminaires are reliably protected against moisture and temperature fluctuations thanks to their excellent seal tightness.

INVISIBLE CHALLENGE OF DIGESTER GAS



AT ALL LEVELS: DIGESTER GAS HAS IT ALL

Methane, hydrogen sulphide and ammonia make digester gas a mixture that has it all. Digester gas is formed when bacteria decompose organic substances such as plant residues or waste water that does not contain oxygen. It consists mainly of methane and carbon dioxide. In addition, it often contains smaller amounts of other gases such as hydrogen sulphide and ammonia. The hydrogen sulphide content in particular can have a corrosive effect, as it forms aggressive sulphuric acid in combination with moisture.

This special atmosphere must also be taken into account when choosing the lighting.

The special atmosphere requires luminaire housings that are resistant to digester gases in order to ensure a fail-safe and low-maintenance lighting system. Excellent seal tightness and resistant materials protect the built-in electronics against corrosion.

A DIFFICULT TASK FOR LUMINAIRES

Properly functioning lighting is absolutely essential in this completely underground area.

THE SAFETY FACTOR OF LIGHTING

The "Czajka" treatment plant is the largest state-of-the-art sewage works in Poland, located in the Białołęka district in Warsaw. "Czajka" is used to collect urban waste water and the waste water from surrounding municipalities and another water treatment plant. Two underground tanks of the plant have proved to be particularly difficult when it comes to lighting: zero daylight and high levels of humidity mean a high risk of accidents occurring. It is absolutely essential for the lighting to function properly.

CHALLENGE IN THE DEPTHS

Extremely high air humidity and concentrations of hydrogen sulfide permeate the atmosphere of the two basins. This places high demands on the materials used: They must not only be waterproof, robust and resistant to hydrogen sulfide vapours, but their maintenance requirements also need to be as low as possible.

Harsh environmental conditions placed heavy demands on the previous lighting. In contrast, the ZUG LED has been doing its job for several years without any problems.

Our luminaires provide the right light for the “Czajka” waste water treatment plant in Warsaw. Other luminaires have been unable to cope with the high demands of the harsh environmental conditions – namely, extremely high humidity and hydrogen sulfide in the atmosphere.

These are challenges that all previous luminaires failed to meet. Repeated attempts at repairs were only ever able to remedy the situation for short periods of time. The installed luminaires became brittle, water seeped in and they had to be repaired twice a month. The maintenance costs rose accordingly.

ZUG LED PROVES ITS RELIABILITY

In their quest for reliable, well-functioning lighting, the power plant operators approached our Polish trade partner, who found the ideal solution in our ZUG LED luminaires: Waterproof to 20 metres with their protection rating of IP 68, they are not only resistant to chemicals, but are also low-maintenance. For several years now, the ZUG LED luminaires have been doing their job and defying the hostile conditions – no repairs or unscheduled maintenance have been necessary.

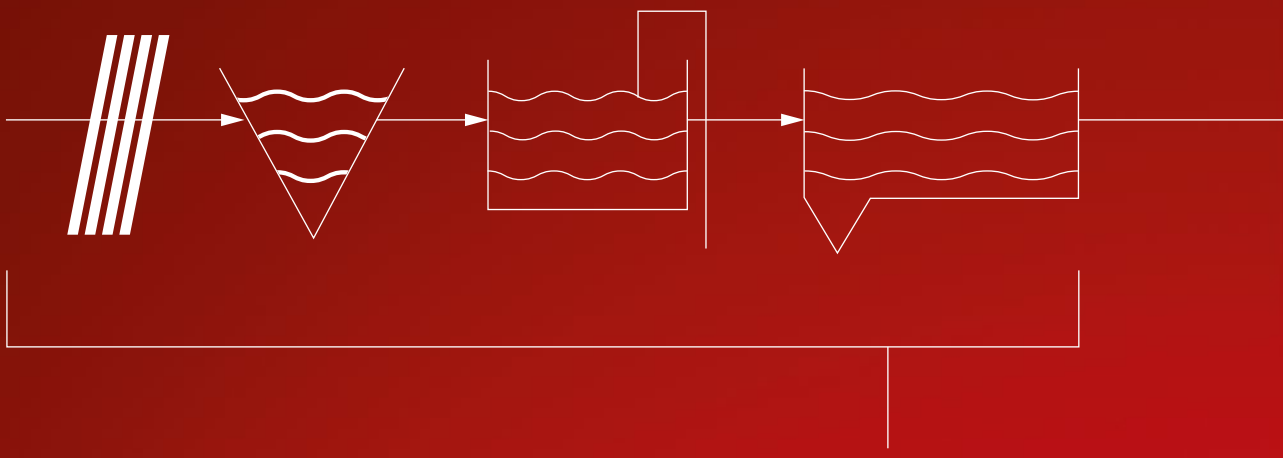
POWERFUL LIGHTING FOR SCREENING PLANT AND AERATION TANKS

Waterthight and dust-proof luminaires with increased chemical resistance are the basis for low-maintenance lighting in the area of mechanical cleaning.

IP 65 | IK 04 PMMA | IK 09 PC

ERFURT LED

- jet water and dust proof
- resistant to a wide range of chemicals
- suitable for areas in the mechanical cleaning stage such as the screening plant, sand and grease trap



Mechanical cleaning stages

IP 65 | IP 66 | IP 67 | IP 68 20m | IP 69K | IK 09 PMMA | IK 10 PC

ZUG LED

- tubular luminaire resistant to pressurised water
- resistant to a wide range of chemicals
- optional potting for supply cables for increased seal tightness
- suitable for areas in the mechanical cleaning stage such as the screening plant, sand and grease trap

BIOLOGICAL & CHEMICAL CLEANING

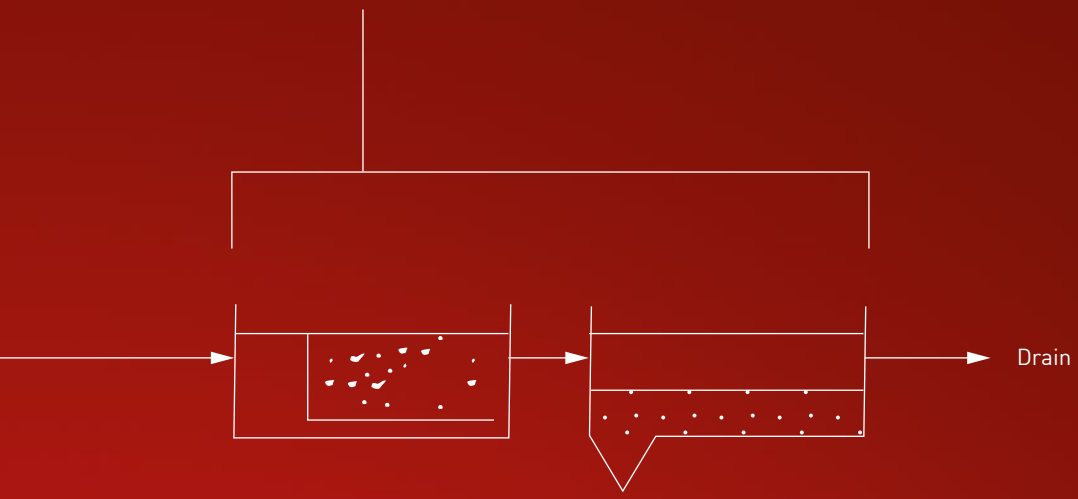
Luminaires that are particularly resistant to ammonia and hydrogen sulphide, for example, are suitable for biological and chemical cleaning stages such as aeration tanks and clarifiers.

IP 65 | IP 67 | IK 04 PMMA

COESFELD

> Ammonia-resistant polymer luminaire
> resistant to a wide range of other chemicals
> suitable for areas in the biological cleaning stage such as aeration tanks and clarifiers

Biological and chemical cleaning stages



IP 65 | IP 66 | IP 67 | IP 68 20m | IP 69K | IK 09 PMMA

LUGANO

> gas-tight and ammonia-resistant tubular luminaire
> resistant to a wide range of other chemicals
> suitable for areas in the biological cleaning stage such as aeration tanks and clarifiers

IP 65 | IP 66 | IP 67 | IP 68 1m | IK 07 PMMA | IK 09 PC

LUZERN 38 LED

> tubular luminaire resistant to pressurised water
> resistant to a wide range of chemicals
> optional potting for supply cables for increased seal tightness
> suitable for areas in the biological cleaning stage such as aeration tanks and clarifiers

OPTIMAL LIGHT IN A HARSH ATMOSPHERE

The ERFURT LED is used in the machinery halls, which is reliable even in chemically aggressive environments.

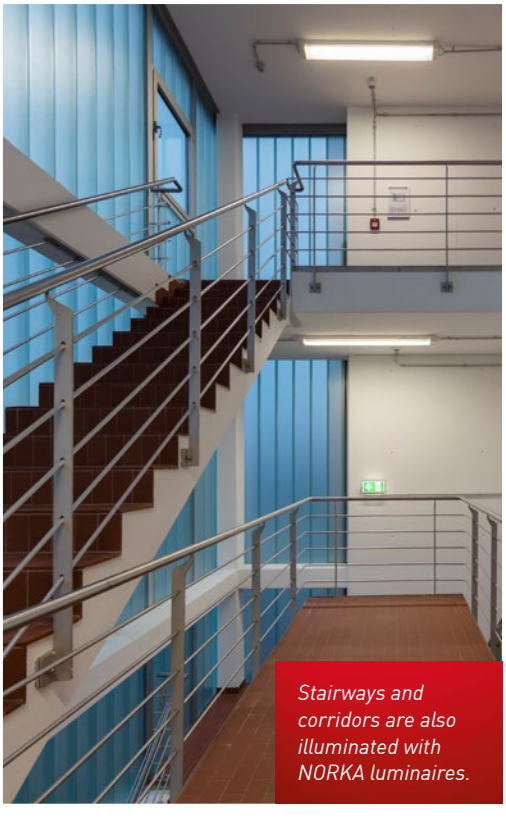
Energy-efficient, centrally monitored and controlled and long lasting: NORKA delivers the lighting system for the new building of the large-scale Köhlbrandhöft Kläranlage in Hamburg.

At Köhlbrandhöft Kläranlage, 150 million cubic metres of waste water are treated annually before they flow into the Elbe River. The water comes from private households and from industry or is mixed water from precipitation. 556 pumps, 250 employees and myriads of busy micro-organisms take care of the biological purification.

Despite the enormous volumes, the waste water treatment plant is self-sufficient in terms of energy; in other words, it produces its own electricity – from digester gas, sewage sludge, wind and the sun. All efforts are focused on maximising energy efficiency – including at the lighting level, for example, in the new grit treatment hall and the equally new screening building. Both the general lighting and the safety lighting have been completely designed with LED luminaires from NORKA.

RESISTANT TO SEWAGE GASES

ERFURT LED luminaires are used in both machinery halls as this type of luminaire also performs reliably in chemically aggressive atmospheres. NORKA luminaires are also used in the corridors and stairwells and as escape route luminaires. As a lighting specialist for tough environments, NORKA tests its materials for resistance to various chemical substances. But not only the luminaires themselves, but also the associated mounting rails are designed for maximum resistance, of course also with



Stairways and corridors are also illuminated with NORKA luminaires.

regard to sewage gases. That's why explosion-proof elements were also installed in part at Köhlbrandhöft Kläranlage.

Some of the luminaires are equipped with batteries – any necessary function and runtime tests can be carried out automatically, centrally and at defined time intervals in accordance with EN 50172/VDE 0108. All of the results are documented in compliance with standards. This feature was expressly requested by the owner and operator of the waste water treatment plant, Hamburg Wasser. NORKA resolved this part of the requirement specification at control level.

INTEGRATION INTO THE PROCESS CONTROL ROOM

All the luminaires in a building converge in the central control cabinet, which is supplied completely pre-wired by NORKA Automation. The touch panel in the front of the cabinet can be used to manually override the automatic system if necessary, for example, when local maintenance work is due or the lighting time profiles need to be adjusted.
Each of these switching units links its information through defined interfaces to the primary central process control system of the waste water treatment plant. This allows status data and error messages to be received centrally in the control room; from there, queries can be made and maintenance staff can be given automated work orders.

A UNIFIED WHOLE

This project exemplifies how much synergistic potential can evolve from a comprehensive solution developed by NORKA. In addition to the specific selection of suitable luminaires and emergency lighting, this particularly includes the conception of the control system and its programming, the energy distribution and ultimately the specific support of the planners.

FOR EXPLOSION HAZARDOUS AREAS

WE PREVENT SPARKS FLYING

LUMINAIRES FOR EXPLOSION HAZARDOUS AREAS:

ZONE 1 **ZONE 2** **ZONE 21** **ZONE 22**

Sometimes a single spark is enough and there's an explosion – ATEX-certified luminaires are therefore used in explosion hazardous areas. In the area of water management, digestion towers or digester gas-conveying lines as well as waste water and sewage sludge are potential hazardous locations or sources. When assessing the risk, it does not matter if there is an ignition source in the area.

Depending on the risk and nature of the hazard, different zones can be distinguished according to the ATEX directive of the European Union.

A differentiation is made according to the frequency of the explosion risk. NORKA offers ATEX-certified luminaires for zone 1 and zone 21 as well as zone 2 and zone 22.

ATEX-CERTIFIED FOR EXPLOSION HAZARDOUS AREAS

BRIEF OVERVIEW OF ATEX ZONES

ATEX is the abbreviation of the French name for explosive atmospheres "ATmosphères EXplosibles" and a European certification according to the applicable ATEX directive of the European Union. The potentially explosive areas are classified into explosion protection zones – depending on the required degree of protection against explosions.

Hazard	**Risk**	**Risk**	**Risk**
	constant, very frequent and present **over a long period of time**:	**occasionally** present:	**rarely** present or **just for a short time**:
Gases, vapours or mist	Zone 0	**Zone 1**	**Zone 2**
Dusts	Zone 20	**Zone 21**	**Zone 22**

IP 65 | IP 67 | ZONE 2 | ZONE 22 | IK 09 PC

BASEL LED

- explosion-proof surface mounted ceiling luminaire
- resistant to a wide range of chemicals
- for use in industrial applications with explosive atmospheres according to zone 2, 22.
- suitable for sludge treatment areas

IP 65 | IP 66 | IP 67 | IP 68 20m | IP 69K | ZONE 2 | ZONE 22 | IK 10 PC

BERN LED EX

> explosion-proof tubular luminaire that is resistant to pressurised water
> for use in industrial applications according to zone 2, 22
> suitable for sludge treatment areas

IP 66 | IP 67 | IP 68 10m | ZONE 1 | ZONE 2 | ZONE 21 | ZONE 22 | IK 11 PC

LAUSANNE

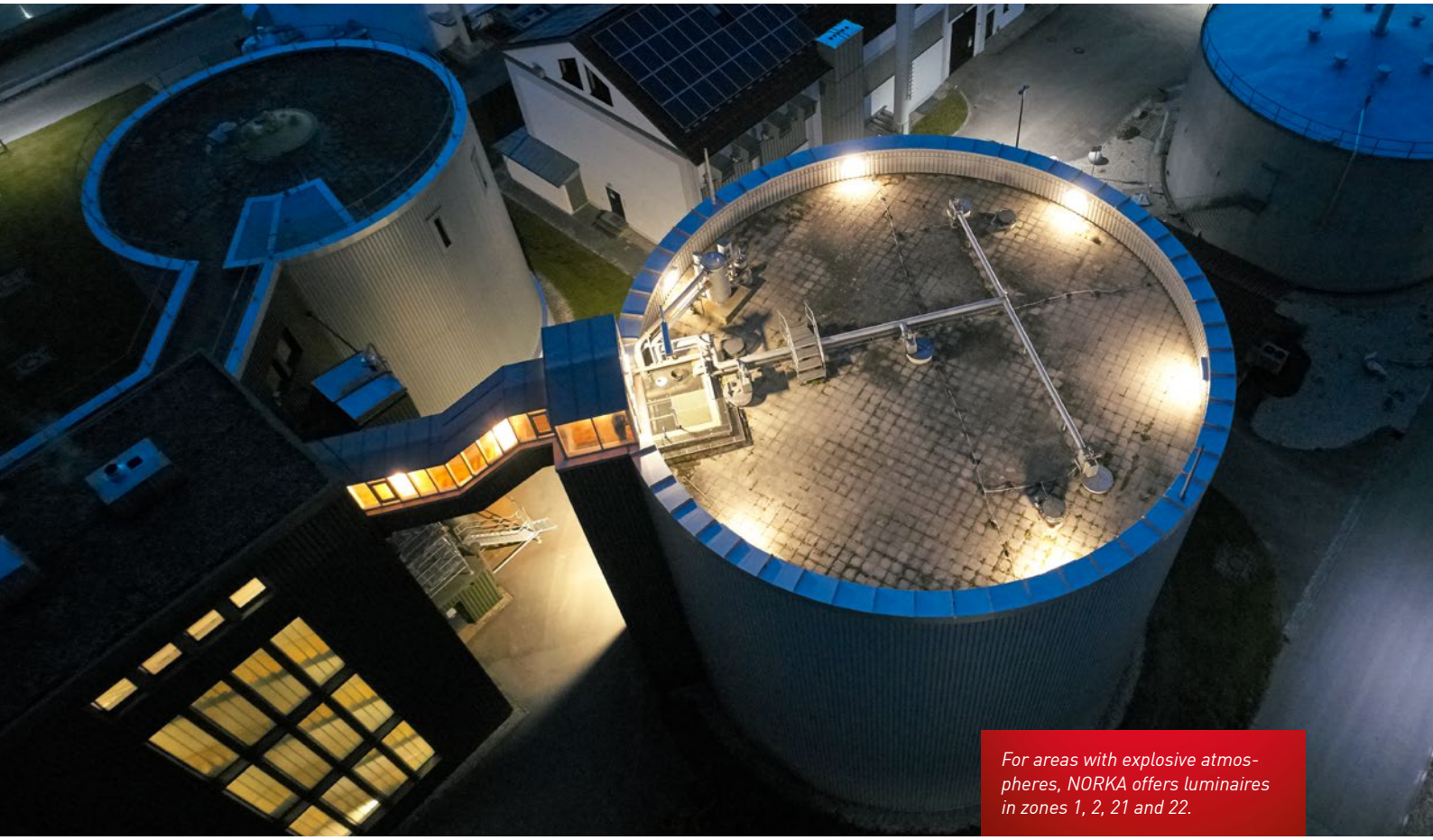
> explosion-proof tubular luminaire that is resistant to pressurised water
> for use in industrial applications according to zone 1, 2, 21, 22
> qualification according to ATEX, IECEx
> suitable for sludge treatment and digester gas tower areas

IP 66 | IP 67 | ZONE 1 | ZONE 2 | ZONE 21 | ZONE 22 | IK 10 PC

WEIMAR

> explosion-proof surface mounted luminaire
> for use in industrial applications according to zone 1, 2, 21, 22
> qualification according to ATEX, IECEx, UKEX
> suitable for sludge treatment and digester gas tower areas

LIGHTING SOLUTIONS FOR DIGESTION TOWER AND AERATION TANKS

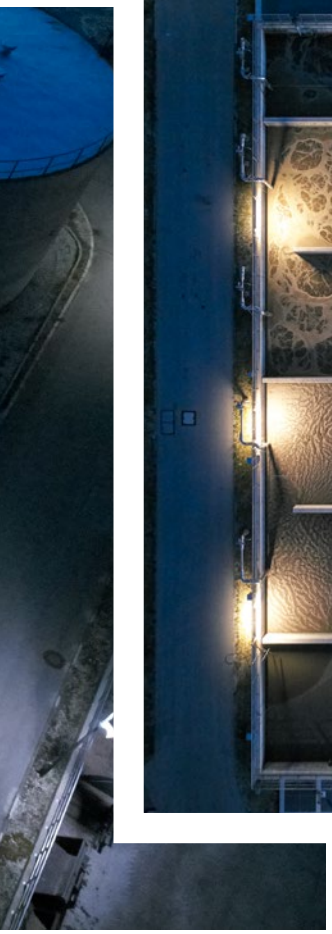


For areas with explosive atmospheres, NORKA offers luminaires in zones 1, 2, 21 and 22.

Municipal company Ver- und Entsorgung München Ost, or VEMO for short, with headquarters in Poing, operates Neufinsing Kläranlage. In the waste water treatment plant, the dirty water is disposed of by 13 member municipalities from the districts of Ebersberg, Erding and Munich. This region in the east of Munich is currently experiencing a sharp increase in the number of inhabitants. In view of the booming municipalities and in order to remain up-to-date with the latest technology, the operator is focusing on the expansion and continuous modernisation of the waste water treatment plant. One measure was the renewal of the lighting in several areas. The luminaires were installed for various purposes. Some were used to replace old lighting points, for example, on the digestion tower, while others were used for first-time installation, for instance, on the scraper bridge.

Maintenance and repair measures on the systems, reading measured values or even recovering objects that are blocking the rakes in the tanks – this is typical work in a waste water treatment plant for which bright and glare-free lighting is required. Light with sufficient illumination levels and high uniformity is naturally also indispensable on paths because they often lead through the terrain via stairs, gratings or bridges. In Neufinsing Kläranlage, several luminaire types from the NORKA range are used for both work and path lighting, often fulfilling both tasks in combination and therefore ensuring good visibility and safety at the same time.
ZUG LED and LUZERN LED tubular luminaires, among others, were installed on the scraper bridge above the clarifier and around the aeration tanks.

NORKA optimally fulfils the lighting requirements for areas with harsh operating conditions and a high need for safety – which is demonstrated at Neufinsing Kläranlage plant in eastern Munich.



Tubular luminaires were installed around the aeration tanks, which could be easily attached to the railings and parapets.

A large area at the base of the digestion tank is illuminated by a URANUS LED spotlight. The URANUS LED series includes models with a luminous flux up to 15,100 lumens. In this way, uniform area illumination from high mounting heights is also possible. A luminaire housing made of weather and UV-resistant polymer, a swivelling reflector housing made of die-cast aluminium and age resistant gaskets made of form-retaining silicone/synthetic rubber guarantee this spotlight will have a long service life. This saves on time-consuming maintenance or repairs at great heights.

With luminaires from the NORKA range, the wide variety of illumination tasks in the waste water treatment plant were able to be ideally solved. The products have the right technical features for the harsh operating conditions, whilst convincing with their efficiency and high light quality. They were also able to qualify for the project through their ease of assembly. The ready-to-connect delivery and simple wiring saved a lot of time during installation.

As a result, the lighting in the waste water treatment plant could be renewed during operation without any problems and to the satisfaction of the customer. The light works reliably as a building block to develop an innovative waste water treatment plant within existing facilities, which guarantees the security of supply for citizens, companies and institutions.

With their impact strengthened protective tubes made of PMMA Transopal and high protection ratings, they are ideally equipped for demanding outdoor use. With a luminous flux of 7,900 lumens, these luminaires placed on the parapets of the bridge or the railings around the tanks ensure sufficient illumination levels on the traffic areas and also on the lower lying water areas in the tanks.

A particularly careful product selection was required for lighting the plateau at the top of a digestion tower because methane gas is extracted from the sewage sludge in the digestion tower and the luminaires need to be explosion-proof. NORKA offers luminaires for use in zones 1, 2, 21 and 22, such as the WEIMAR.

From the parapets and railings, the luminaires ensure sufficient illumination levels on traffic areas and on the water surfaces in the tanks.

Scan the QR code
and find
your contact!

You can also find your contact at norka.com!

NORKA

Norddeutsche Kunststoff-
und Elektrogesellschaft
Stäcker mbH & Co. KG

Lichttechnische Spezialfabrik

Contact
Weidestraße 122 a
22083 Hamburg
Germany

T. +49.40.51 30 09-0

info@norka.com
www.norka.com

110051 04.2025 V1.0 500