Notice

DESCRIPTION EP2204604

[0001]

The invention first relates to a luminaire for illuminating building surfaces according to claim 1.

[0002]

As a luminaire for illuminating building surfaces any lights are considered that serve as a floor, wall or ceiling light of a building, possibly as a spotlight or recessed luminaire, the illumination of a building or a part of the building. Similarly, these are understood to be lights, the surfaces of an outdoor area of a building, so z. B. parking areas, green areas or roads, can illuminate. Under illuminating building surfaces within the meaning of claim 1 also understood to be illuminated paintings or art objects.

[0003]

In the course of the further development of LEDs, these have recently been increasingly used for the illumination of building surfaces. So far, the achievable light distribution of a luminaire operating with LEDs - at least in certain applications - is unsatisfactory.

[0004]

The object of the invention is first to provide a luminaire, which has an improved, and if necessary in detail exactly predeterminable light distribution using LEDs. Next, a luminaire is to be provided, which allows recourse to standardized components of a lamp by replacing only a few components of the luminaire a modified light distribution.

[0005]

The invention solves this task initially with the features of claim 1.

[0006]

The principle of the invention consists essentially in equipping a luminaire with a circuit board, a secondary optic and a tertiary optic.

The board is the component that carries one or more LED's. The lamp can also include several boards. As a circuit board is generally referred to that circuit board on which the LEDs are mounted, either by soldering or any other suitable fastening. The board in the sense of claim 1 forms insofar the mechanical support member for the LED or the plurality of LEDs.

[0007]

The LEDs can equally be of any design. It may be monochrome or multi-colored or differently colored LED's. The LEDs already have a primary look. This can be, for example, a lens body formed from transparent plastic or the like material, which has been attached directly to the LED, typically already during the manufacturing process of the LED. This can already ensure a certain focusing of the light, so that the commercially equipped with a primary optics LED, for example, has a radiation angle of 120 ° to 180 °. Other radiation angles are possible.

[0008]

In addition, the luminaire according to the invention comprises a secondary optic which focuses the light emitted by the LEDs. The secondary optics is formed by one or more lens bodies, which are designed to be translucent and have precisely calculated boundary courses in order to focus the light emitted by the LEDs. In particular, the secondary optics serve to convert the light emitted by the LEDs substantially into a parallel light beam path, which can be made available for subsequent photometric processing of a subsequent tertiary optic.

[0009]

The secondary optics can be formed by cup-shaped elements in cross section, which widen in cross section with increasing distance from the LED's. These lens elements can be placed directly on the board and overlap the existing there LED's so that they can absorb all the light emitted by the LED's light and processed in terms of lighting technology. As a secondary optics is understood to mean both a lens assembly which represents a one-piece component which engages over a plurality of LEDs, as well as a plurality of such lens bodies, which engage over individual LEDs.

[0010]

Preferably, the board is firmly attached to a lamp housing. The secondary optics are also firmly attached to a luminaire housing. Further preferably, the secondary optics is fixed directly to the board.

[0011]

The luminaire according to the invention further comprises a tertiary optic. The term tertiary optics takes into account that in the direction of the light path, this optics is the third element which causes a light-directing effect.

[0012]

The Tertiäroptik is formed in the lamp according to the invention of a flat, translucent element. As a flat element, each flat, plate-shaped element, but possibly also curved element is referred to, which is formed thin-walled. In particular, dome-shaped flat elements also fall under the term tertiary optics in the sense of claim 1.

[0013]

The Tertiäroptik is translucent, d. H. she basically lets the light through. Due to inventively provided light-guiding microstructures, however, a steering of the light takes place.

[0014]

As light-directing microstructures in the sense of the present patent application, all surface structures incorporated in one or both surfaces of the element are understood. These can be calculated and predefined to a very exact extent and worked into a corresponding tool shape. In particular, the microstructures may have facets whose light-directing interfaces are formed by curved surfaces or planar surfaces.

[0015]

In the case of a tertiary optic formed as a plate-shaped element, a structured grid of such facets may extend along the entire plate surface. In this case, facets with a curved surface and facets with a flat surface can alternate. Alternatively, provision may be made for areas of curved surface facets and regions of facets having a planar surface to extend along the plate surface. Finally, the plate surface may also be divided into different sections, with facets having a first type of curvature being arranged in a first section and facets having a second type of curvature being arranged in a second section. In particular, it is also possible to provide facets which allow the light to pass through without a light-directing effect.

[0016]

Due to a predetermined surface topography of the translucent element in detail, the radiation behavior of the luminaire can be predetermined to a very accurate degree. By appropriate arrangement of certain facets with certain surface properties or by an appropriate choice of the type of surface, the light emission of the luminaire can be influenced in the desired manner.

To illustrate, the following example is chosen:

[0017]

Suppose that the translucent element is formed by a flat plate which is completely covered with spherical facets on its inside, that is to say the side facing the secondary optics. Then, by choosing the radius of the individual facets, the beam angle of the luminaire can be influenced. If facets are used which have a uniformly small radius, a larger emission angle is generated than if facets are used whose surface curvature has a larger radius throughout. In this way, a light can optionally be equipped with a corresponding lens plate with microlenses of the first kind or with another lens plate with microlenses of the second kind. By appropriate replacement of the tertiary optics (ie the lens plate), the radiation behavior of the lamp can be changed accordingly.

[0018]

This makes it possible for the first time to realize luminaires that use LED's as light sources and, with essentially the same external design and resorting to identical components, such as the circuit board and secondary optics, both a radiation behavior of a spotlight and alternative use of a corresponding tertiary optics, the radiation behavior of a floodlight or a wide-flood (with a large angle of radiation).

[0019]

The light-directing microstructures can be incorporated in different ways.

For example, it is conceivable that the tertiary optic is formed by a plastic injection-molded part. In this case, the light-directing microstructures may be incorporated into the mold. When manufacturing the injection-molded part, the structures transfer accordingly to the molding.

[0020]

Theoretically, it is also possible to manufacture the light-directing microstructures individually by means of individual workpiece machining, that is, for example, by milling each workpiece. Although this is considered to be quite expensive, it should be included in the invention.

[0021]

In addition, it should be pointed out that, as light-directing microstructures within the meaning of the patent application, only those microstructures are understood which are arranged in the sense of a predetermined light emission behavior and for optimizing a desired light intensity distribution. Light-directing microstructures in the sense of the patent application are not mere roughening of the surface of the tertiary optics, for example by etching or sandblasting, since in this way only diffusing, but not light-directing microstructures are provided.

[0022]

According to an advantageous embodiment of the invention, the microstructures are formed by facets. This allows the individual predetermination and calculation of the surfaces of the facets.

[0023]

At least some of the facets have a domed surface. This allows, for example, the realization of a desired light distribution by an appropriate choice of the curvature of the surface.

[0024]

Advantageously, the surface of the facets is spherically curved. This allows recourse to conventional calculation methods.

[0025]

Alternatively or additionally, the surface of some facets may be aspherically curved. In this way - albeit under the requirement of complicated simulations - particularly optimized light distributions of the luminaire can be achieved.

[0026]

Further advantageously, it is provided that the surface of at least some facets is cylindrically curved. In this case, recourse can be made to calculation methods which are already used in the construction of facets having reflectors.

[0027]

Further advantageously, the surface of at least some facets is provided by a rotational paraboloid. This makes it possible in particular to achieve desired cut-off angles, and thus a sharp limitation of the light intensity distribution at the lateral edges.

[0028]

Furthermore, it is advantageously provided that at least some of the facets have a planar surface. This allows a targeted light control of luminous flux components in certain solid angle ranges.

[0029]

The flat surface is basically arranged inclined at an angle to the main emission of the LED's.

[0030]

The microstructures are advantageously arranged on the side of the element which faces the secondary optics.

[0031]

Alternatively and / or additionally, the microstructures may also be arranged on the side of the element which faces away from the secondary optics.

[0032]

Particularly advantageously, the element is arranged at a distance from the secondary optics.

This allows a particularly advantageous construction, in particular a fastening of the tertiary optics to a luminaire housing of the luminaire, independently of the attachment of the secondary optics to the luminaire housing.

[0033]

According to a further advantageous embodiment of the invention, the secondary optics impinges the tertiary optics with essentially parallel light beams.

This embodiment of the invention is based on a secondary optics, which bundles the light emitted by the LEDs light in a particularly advantageous manner.

As essentially parallel light rays, those light rays are referred to which, at least in a first approximation, come parallel to one another from the secondary optics to the tertiary optics. This allows a particularly well predictable photometric processing of the LED light emitted by the secondary optics.

[0034]

According to a further advantageous embodiment of the invention, the element is formed by a flat plate. This allows the construction of a luminaire with a very compact design. Furthermore, a Tertiäroptik comprising an element with a flat plate, an optically optimized interaction with LEDs are ensured, which are arranged on a flat board.

[0035]

In an alternative embodiment of the invention, the element is curved. This embodiment of the invention can be used advantageously, for example, if the printed circuit board is arched or several boards or a plurality of LEDs are positioned and arranged relative to each other such that the total LEDs are arranged along a curved space surface.

[0036]

According to a further embodiment of the invention, the element has several sections which show different lighting behavior. In this case, provision can be made, for example, for a first section to be arranged on an element, in which microstructures of the first type and a second section are arranged, in which light-directing microstructures of the second type are provided. The light-directing structures of the first type can be formed, for example, by spherically curved facet surfaces and the microstructures of the second type by cylindrically curved facet surfaces. Any other arbitrary constellation of surface characteristics is possible. The different sections may be formed contiguous. However, it can also be provided that the individual different facet surfaces are arranged according to a pattern which is not recognizable to the viewer. This pattern is only revealed in a deep understanding of the simulation method, which simulates the radiation behavior of the luminaire on a computer in advance of the construction of a corresponding tertiary optic.

[0037]

Advantageously, the lamp is arranged stationary.

[0038]

Further advantageously, it is provided that the board and the secondary optics are arranged within a lamp housing.

Optionally, it may also be provided that the tertiary optics is arranged within the luminaire housing.

[0039]

Finally, it can be provided that the tertiary optics is arranged in the manner of a lamp terminating glass at or near or in the light exit opening of the luminaire.

[0040]

As a result, a recourse to lighting essentially conventional design and - if desired - even compact designs possible.

[0041]

Further advantageously, it can be provided that the tertiary optics can be attached to a luminaire housing of the luminaire with fastening means.

In this way, for example, it can also be ensured that the tertiary optics can be detachably fastened to the luminaire housing.

Finally, the replacement of a tertiary optic in such a way that the tertiary optic is designed as a "changeable" Tertiäroptik can be guaranteed.

[0042]

The invention further relates to a modular system for luminaires according to claim 12.

[0043]

This invention has for its object to provide a modular system for luminaires, which allows for luminaires that use LED's, allowing access to existing components and the exchange of only a few parts different emission characteristics of luminaires.

[0044]

The invention solves this problem with the features of claim 12.

[0045]

The principle of the invention is to provide a modular system for luminaires, are illuminated with the building surfaces.

The modular system comprises a board on which a plurality of LEDs are arranged.

Furthermore, a secondary optics is provided which bundles the light emitted by the LEDs.

Finally, the modular system comprises a first tertiary optic of predetermined design. Tertiary optics of a predetermined design are understood to mean such a flat, translucent element which has light-directing microstructures of the first type and which has a predetermined dimension. In the case of an element formed as a plate, this includes, for example, the dimension of the plate in width and height. In the case of a translucent element, which is curved, this includes, for example, its arch height and the diameter of the free edge.

[0046]

The module system also includes a second tertiary optic of the same design. The second tertiary optic is again formed by a flat translucent element. However, this has light-directing microstructures of the second kind. The first tertiary optic is interchangeable with the second tertiary optic. Interchangeability in the sense of claim 12 means that the second Tertiäroptik can be fastened with the same fastening means to a lamp housing of the lamp as the first Tertiäroptik. The first tertiary optic can thus be detached from the luminaire and replaced by the second tertiary optic.

[0047]

As a second tertiary optic, in the case of the element formed as a plate, a plate having the same dimension in width and height or, in the case of a curved element, one having the same curvature height and the same diameter of the fine edge is designated.

[0048]

As a further feature according to the invention, it is provided that the microstructures of the second type enable a radiation characteristic of the luminaire modified in comparison with the microstructures of the first type.

This means that the microstructures of the second type are formed changed with respect to the microstructures of the first kind. Individual or all surfaces of the individual facets are differently designed or positioned differently.

[0049]

In this way, by replacing the Tertiäroptik while maintaining identical components of the lamp, namely an identical luminaire housing, an identical board or an identical secondary optics, a completely different optimized radiation behavior of the lamp can be achieved.

[0050]

With regard to the definition of the features of claim 12, reference is made to the subclaims acknowledged in claims 1 to 11, wherein the definitions given here apply equally to claim 12.

[0051]

By way of example, it should be mentioned that a first tertiary optic can be formed, for example, as a plate-shaped element with a lens structure which has numerous lens bodies as facets with a curvature which are curved around a first large radius, and a second tertiary optic which is of similar design. in which, however, the individual facets have a curvature that extends around a different, smaller radius.

While the first element allows a light emission characteristic of the luminaire with a small emission angle, when using a second tertiary optic, the corresponding element allows a radiation characteristic of the luminaire with a large emission angle.

[0052]

Advantageously, it is provided that the microstructures of the first type comprise facets with light-directing surfaces of the first type, and the microstructures of the second type comprise facets with light-directing surfaces of the second type.

As in the above-described embodiment of the luminaire according to claims 1 to 11, the microstructures of facets can be provided. The facets each have an individually predetermined and precalculated surface that can direct the light striking them. By choosing the type of surface and positioning the surface, the light steering can be done in the desired manner to achieve a desired light distribution of the lamp.

[0053]

According to a further advantageous embodiment of the invention, the first tertiary optics allow a first emission angle of the light emitted by the lamp and the second tertiary optics a second, different from the first emission angle radiation angle. Thus, for example, a radiation angle of the lamp can only be changed by replacing the tertiary optics. Thus, in a group of luminaires, a first luminaire can provide a spotlight distribution, a second luminaire a floodlight distribution, and a third luminaire a far-light distribution corresponding to a smaller, medium and large emission angle. All three lights of this group have an identical external design and identical components and housing, with a different Tertiäroptik is provided as the only different component.

[0054]

The invention further relates to a modular system according to claim 15.

[0055]

The invention has for its object to provide a modular system in which, with recourse to substantially identical components and exchange only a few parts a changed emission characteristics of the lamp is made possible.

The invention solves this problem with the features of claim 15.

[0056]

The principle of the invention is that a first and a second planar translucent element are provided, both having a same predetermined design. The flat translucent element is interchangeable attached to a housing of the lamp. The first translucent element has microstructures of the first type, and the second translucent element has microstructures of the second type. By replacing the translucent element, the emission characteristics of the luminaire are changed.

[0057]

The module system according to claim 15 is best understood in recognition of claim 12, wherein it should be noted that claim 15 illustrates the inventive principle regardless of the type of light source. In contrast to claim 12, furthermore, the translucent element also does not necessarily have to be a tertiary optic, but can - assuming a conventional light source such as a low-voltage hologen lamp or any other, in particular punctiform light source - the translucent element, the first, so to speak primary Be optics of this lighting system.

[0058]

Further advantages will be apparent from the non-cited subclaims and with reference to the following description of the embodiments illustrated in the drawings. 1 shows a schematic representation of a first exemplary embodiment of a luminaire according to the invention with a printed circuit board, a secondary optic and a tertiary optic and with an optical path exemplified by a pair of light arrows, FIG. 2: in a partially sectioned view according to the arrow II in FIG. 1 shows the underside of the tertiary optic, FIG. 3 shows a first embodiment of a spherical facet approximately according to section line III-III in FIG. 2 4 shows in a representation according to FIG. 3 a modified embodiment of a spherical facet compared to FIG. 3, FIG. 5 shows a further embodiment of a luminaire according to the invention in a schematic illustration, and FIG. 6 shows a schematic view of the exemplary embodiment of FIG Fig. 5 according to view arrow VI.

[0059]

The designated in their entirety in the figures with 10 luminaire will be explained below with reference to the drawings. The description of the figures should be made in advance that, for the sake of clarity, identical or comparable parts or elements, even insofar as different embodiments are concerned, are provided with the same reference numerals.

[0060]

Fig. 1 shows a first embodiment of a lamp 10 according to the invention, wherein the luminaire housing has been omitted for clarity.

[0061]

Fig. 1 shows a printed circuit board or board 11, on which three LED's 12a, 12b and 12c are arranged.

The circuit board 11 may be mounted, for example, on a support plate 13.

[0062]

Not shown are other required to operate the LED's components such as microprocessors, resistors, capacitors, electrical leads, cooling elements, etc .. Fig. 1 is insofar - as well as the rest of the figures - only to be understood schematically.

[0063]

The LEDs 12a, 12b, 12c are overlapped according to FIG. 1 by a secondary optics 14. The secondary optics 14 is a plurality of lens bodies 15a, 15b, 15c formed of a transparent plastic. As can be seen from the figures, the lens bodies have a cross-section widening upwards with respect to FIG. The lens body are shown in Fig. 1 only schematically. They actually include a plurality of interfaces that cause the light emitted by the LEDs 12a, 12b, 12c to be focused. Fig. 1 illustrates that, as is clear for example by means of the light beam of the light beams 26, 27, 28 and 29, that from the LED's initially a light beam 26a, 27a, 28a, 29a emanates, which has a very wide distribution. In other words, the light emitted by the LED 12c includes, for example, an emission angle of about 120 ° to nearly 180 °.

[0064]

The corresponding lens body 15c which overlaps the LED 12c has a multiplicity of boundary surfaces, wherein in FIG. 2 only the boundary surfaces 30a and 30b are shown. Upon impingement of the respective light beams 26a, 27a, 28a, 29a, the light

beams are totally reflected at the interface 30a and 30b such that a bundle of light beams 26b, 27b, 28b, 29b is emitted from the secondary optics 14 which is substantially parallel is aligned.

[0065]

It should be noted here that the observation made is also schematic and simplified and serves for a better understanding of the invention.

[0066]

A tertiary optic 16 is arranged at a distance A from the secondary optics.

The distance A is between 1 and 100 mm. Further preferably, the distance A is between 10 and 80 mm, more preferably between about 10 and 50 mm. The Tertiäroptik 16 is in the embodiment of FIG. 1 of a plate-shaped translucent, d. H. transparent element, formed. This may consist in particular of plastic.

[0067]

It has an underside 17, which faces the secondary optics 14, and an upper side 20, which faces away from the secondary optics 14.

[0068]

In the embodiment of FIG. 1, 16 light-directing microstructures 18 are arranged on the underside 17 of the tertiary optics.

[0069]

Fig. 2 illustrates that the microstructures 18 are formed by a plurality of facets 19a, 19b, 19c, 19d, with only some of the facets shown in Fig. 2 also being designated.

In the embodiment of Fig. 2, the facets are provided with a spherically curved surface 21 a.

As shown in FIG. 3, the facet 19d may have a spherical surface 21a curved around a radius of curvature r. As shown in FIG. 4, the corresponding facet 19d may alternatively also have a curved surface 21b which is curved around a radius of curvature R, where R is significantly greater than r.

[0070]

The schematic schematic diagrams of Figures 2 to 4 are intended to illustrate only that the microstructures 18 may be completely different and adapted to the lighting requirement and to the desired radiation behavior of the luminaire optimized. In the simplest case, the facets 19a to 19d can all be designed identically, for example. Thus, the entire underside 17 of the tertiary optic 16 may be formed by a multiplicity of identical microlenses according to FIG. 3. All of these facets 19 can have a constant radius of curvature r to that extent.

[0071]

In an alternative embodiment of the invention, all the facets are equipped with a radius of curvature R which is different.

[0072]

A luminaire 10 which uses a first tertiary optic 16 with numerous facets 19 with a radius of curvature r has a completely different light emission behavior than a luminaire which has a second tertiary optic 16 of identical construction but with changed microstructures 18, in which the curved surface 21 of the facets 19 a radius of curvature R used

[0073]

Fig. 1 illustrates that when using microstructures of the first kind a certain Lichtabstrahlverhalten the luminaire is achieved: The parallel beam of light 26b, 27b, 28b, 29b is widened as shown in FIG. 1 to a light beam 26c, 27c, 28c, 29th

The expanded radiation angle is designated α in FIG. 1.

[0074]

When using microstructures of a second, on the other hand, changed type, for example using the facets with a surface 21 b of FIG. 4, a contrast beam angle can be achieved, which is correspondingly smaller when choosing a larger radius of curvature R of the surface 21 b of the facets ,

[0075]

The invention is not limited solely to use changed radii of curvature, thereby varying the radiation angle of the lamp.

Instead, by positioning different facets and by forming individual surfaces 21 of individual facets 19, the invention intends to make entirely different light emission characteristics of the luminaire possible.

For example, the light field contour and the intensity distribution within the light field contour can be changed in any way. For this purpose, the surface topography of the underside 17 of a first tertiary optic can be designed as a whole changed relative to the surface topography of a second tertiary optic.

[0076]

FIG. 5 illustrates in a further exemplary embodiment that the circuit board 11, the secondary optics 14 and the tertiary optics 16 are fastened to a luminaire housing 25 or installed inside the luminaire housing. The fasteners and the electrical leads and other required electrical and electronic components and heatsink are not shown in Fig. 5 for clarity.

[0077]

The luminaire housing 25 can be pivoted via a joint 23 relative to a wall-side mounting surface 24. Conventional attachment mechanisms of a luminaire housing 25 on a wall surface can be used.

[0078]

Fig. 6 illustrates that the secondary optics 14 may comprise, for example, nine lens bodies 15a, 15b, 15c, 15d, 15e, 15f, 15g, 15h, 15i. Not shown in Fig. 6, the associated nine LEDs.

[0079]

However, FIG. 6 makes it clear that the tertiary optics 16 of FIGS. 5 and 6 is a circular disk-shaped component. This has shown in FIG. 5 Microstructures 18 of the first kind. The tertiary optic 16 can be detached from the luminaire housing 25 and replaced by another tertiary optic with microstructures 18 of the second type. Since the microstructures of the second type are designed to be different from the microstructures of the first type, the luminaire modified in this way can provide a modified light emission characteristic and shows a completely changed light emission behavior.

Notice

CLAIMS EP2204604

1.

Luminaire (10) for illuminating building surfaces, comprising a circuit board (11) on which a plurality of LEDs (12a, 12b, 12c) are arranged, a secondary optics (14) which bundles the light emitted by the LEDs and a tertiary optic (16) , wherein the tertiary optic is formed by a flat, translucent element having light-directing microstructures (18).

2.

Luminaire according to claim 1, characterized in that the microstructures (18) of facets (19, 19a, 19b, 19c, 19d) are formed.

3.

Luminaire according to claim 2, characterized in that at least some of the facets have a curved surface (21).

4.

Luminaire according to claim 3, characterized in that the surface is spherically curved.

5.

Luminaire according to claim 3 or 4, characterized in that the surface is aspherical curved.

6.

Luminaire according to one of claims 3 to 5, characterized in that the surface is curved cylindrically.

7.

Luminaire according to one of claims 3 to 6, characterized in that the surface is provided by a rotational paraboloid.

8.

Luminaire according to one of the preceding claims, characterized in that the element (16) of the secondary optics (14) spaced (distance A) is arranged.

9.

Luminaire according to one of the preceding claims, characterized in that the secondary optics (14) acts on the tertiary optics (16) with substantially parallel light beams.

10.

Luminaire according to one of the preceding claims, characterized in that the element (16) is formed by a flat plate.

11.

Luminaire according to one of claims 1 to 12, characterized in that the element (16) is curved.

12.

Module system for luminaires (10) for illuminating building surfaces, comprising a circuit board (11) on which a plurality of LEDs (12a, 12b, 12c) are arranged, a secondary optics (14) which bundles the light emitted by the LEDs, and a first Tertiary optic (16) of predetermined design, wherein the first tertiary optic is formed by a flat, translucent element having light directing microstructures (18) of the first kind (Figure 3), wherein a second tertiary optic of the same design is provided, the second tertiary optic of a flat, translucent element is formed, which light-guiding microstructures of the second type (Fig. 4), wherein the first tertiary optic is interchangeable by the second Tertiäroptik, and wherein the microstructures of the second type allow a relation to the microstructures of the first kind modified emission characteristics of the lamp.

13.

Modular system according to Claim 12, characterized in that the microstructures of the first type comprise facets (19, 19a, 19b, 19c, 19d) with light-directing surfaces (21a) of the first type and the microstructures of the second type comprise facets with light-directing surfaces (21b) of the second type ,

14.

Modular system according to claim 12 or 13, characterized in that the first tertiary optic (16) enables a light emission from the luminaire at a first emission angle (α), and that the second tertiary optics allow a light emission at a second emission angle different from the first emission angle.

15.

Module system (10) for luminaires for illuminating building surfaces, comprising at least one light source (12a, 12b, 12c), a first, planar, translucent element of predetermined design (16), which can be arranged in the light path of the light emitted by the light source, and 3), wherein a second planar, translucent element of the same design is provided, which can be arranged in the light path of the light emitted by the light source, and the light-directing microstructures of the second type (FIG. 4) wherein the first element is interchangeable by the second element, and wherein the microstructures of the second kind enable a radiation characteristic of the luminaire which is changed with respect to the microstructures of the first type.