

# OPERATIONS GUIDE

## BLUEDENT LED smart - cordless LED curing light

SMART  
with light meter



### OPERATIONS GUIDE

*ATTENTION! Before installation and starting work with the unit, carefully read these guide!*

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#### I. UNIT DESCRIPTION AND FUNCTION

LED curing light BLUEDENT LED SMART is a light source for intraoral polymerization of dental materials. The unit uses LED (Light Emitting Diode) module as the light source. The emitted light is in the wavelength range 430-490 nm (the relevant range for camphor quinone containing products). BLUEDENT LED SMART consists of Cordless handpiece and Charging station. BLUEDENT LED SMART is produced in conformity with MDD 93/42/EEC.

#### II. TECHNICAL DATA

1. Operating voltage - 110-240V ( $\pm 10\%$ ) / 50-60Hz (see unit label)
2. Power consumption - 0,115-0,055 A
3. Dimensions:
  - Charging station
  - length - 180 mm
  - width - 130 mm
  - height - 66 mm
  - Cordless handpiece
  - diameter - 32 mm
  - length (with lightguide) - 196 mm
4. Weight:
  - Charging station - 560 g
  - Cordless handpiece (with battery & lightguide) - 245 g
5. Light intensity - 800-1200 mW/sq.cm.
6. Emitting time - 10 - 20 - 30 sec. / 9 min. /  $\pm 5\%$ ;
7. Emitted light - blue, 430 - 490 nm
8. Light source - LED module
9. Curing modes - LONG, RAMP, FAST, PULSE.
10. Audible signal every 10 sec. / 1 min.
11. Possibility to turn ON / OFF beeper

12. Possibility for start and stop of Emitting handpiece at any moment.
13. Built-in light intensity meter for check-up at lightguide tip - 4-level - option.
14. Digital display of curing mode and countdown timer.
15. Battery - Li-Ion 2400 mAh, 3,7 V
16. Low battery indication.
17. Working mode (1 min. / 10 min.)

The manufacturer of this unit declares to provide on request all additional necessary technical documentation / information which will help the user's technical staff to service the parts of the unit which the manufacturer has claimed to be a subject for repair.

### III. ACCESSORIES AND SPARES

- Charging station - 1 pce.
- Cordless handpiece - 1 pce.
- Battery - 1 pce.
- Adapter - 1 pce.
- Lightguide - 1 pce.
- Protection shield - 1 pce.
- Protection cap - 1 pce.
- Operations guide - 1 pce.



1. Cordless handpiece
2. Charging station
3. Light meter
4. Start / Stop button
5. Adapter
6. Lightguide
7. Protection shield

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### IV. SAFETY PRECAUTIONS

As with all technical devices, the proper function and safe operation of this unit depend on the user's compliance with the standard safety procedures as well as the specific safety recommendations described in this Operations guide.

1. The unit must be used in strict accordance with the Operations guide. The manufacturer accepts no liability for any damage resulting from the use of this unit for any other purposes.

**NOTE: Lightguide and protection cap must be sterilized before every use !!!**  
**The lightguide is provided in a non-sterile condition and must be sterilized prior to patient contact.**

2. Before start-up of the unit make sure that the operating voltage indicated on the unit label corresponds to the mains voltage. Operation of the unit at a different voltage may damage the unit. Electrical safety is ensured by Protection class II against electrical current damages according to EN 60601-1. Use of "Shuko" plug or unit's grounding is not necessary. BLUE DENT LED SMART should be operated in indoor premises, in the following conditions:
  - temperature +10° C ÷ +40° C;
  - relative air humidity - 30 ÷ 75%;
  - atm. pressure 700 ÷ 1060 hPa;
  - absence of chemically active or flammable substances.

3. Irradiation of the eyes bears certain risk for their damage. Therefore the light must not be directed toward the eyes! Exposure must be restricted to the working area. Use of protection glasses and/or protection shield that blocks effectively the blue spectral range is highly recommended!

**⚠ ATTENTION! The emitted light is in the wavelength range 430-490 nanometers.**  
*During work use protection goggles and/or protection shield!*

4. The unit can be used only doctor's advice or in persons with heart pacemakers implant; persons with photobiological reactions; persons currently taking photosensitive medication; persons with cataract surgery; persons with retinal diseases, etc.

This curing unit produces high-output curing energy! A significant increase in curing energy is possible compared with equipment previously used. It is important to observe the following precautions and procedures:

- Do not place light directly on or towards unprotected gingiva or skin.
- Adjust curing techniques in accordance with the increase in curing energy.

5. Solvents, flammable liquids and powerful heat sources must not be kept near the unit as exposure to one of these factors may damage the plastic parts of the unit.

6. Cleaning agents should not enter the unit as this may short-circuit the unit or cause potentially dangerous malfunction.

7. Only factory-authorized technicians are authorized to open and repair the unit.

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8. Only original BLUEDEDENT LED SMART spare parts should be used to replace defective parts. The unit warranty does not cover any damage resulting from the use on non-original replacement parts. The unit or any of its parts should not be disassembled while it is connected to the mains!

9. Before each patient the lightguide should be cleaned by disinfecting agent (for example desident CaviCide or other approved by Health authorities) and sterilized by autoclave at 134° C for 5 min.

10.  FRAGILE! Be extremely careful during transportation, storage and handling of the unit!

11.  Pursuant to Directive 2002/96/EC, this symbol shows that the product must not be disposed of as urban waste at the end of its operating life. The product must be taken to centers specialized in separate collection of electric and electronic equipment. Correct disposal of the equipment, which is no longer used, prevents negative consequences for the environment and human health!

#### V. PREPARATION AND SEQUENCE OF OPERATION

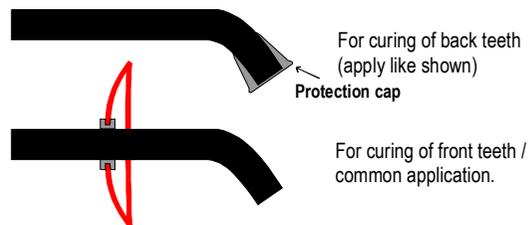
BLUEDEDENT LED SMART is designed for use as a free-standing table unit.

1. Take the curing light BLUEDEDENT LED SMART out from the packing.

**NOTE: Lightguide and protection cap must be sterilized before every use !!!**

2. Mount lightguide and protection shield or protection cap.

See VI. ROUTINE CARE AND MAINTENANCE for instructions of initial cleaning and mounting.  
*Attention! The unit should be placed at least 1 meter away from any heat source.*



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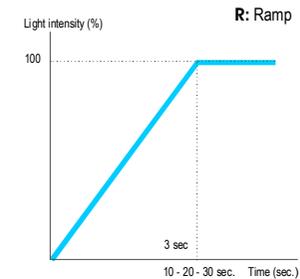
2. Autoclave the lightguide prior to first use, fix the protective filter to it and mount the assembly into the front part of the handpiece.

3. Connect the power adapter to the mains outlet.

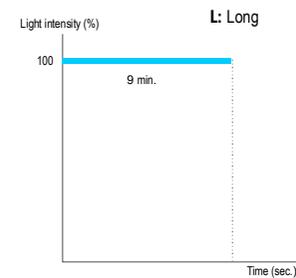
4. The cordless handpiece must be fully charged before starting work for the first time. For this purpose, charge it for at least 10 hours. New Li-Ion batteries attain full capacity only several charging/discharging cycles. Therefore, the battery charge may initially be sufficient for a smaller number of exposures only.

5. BLUEDEDENT LED SMART is equipped with 4 curing modes that guarantee full and fast hardening of the restorative material. Select the curing mode by pressing the button MODE on the digital panel of the handpiece. Press repeatedly until the desired curing mode is selected:

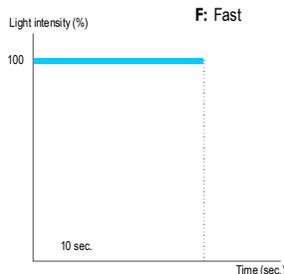
**R - RAMP      L - LONG      F - FAST      P - PULSE**



**RAMP mode (10 - 20 - 30 sec.)** - During the first 3 sec. light intensity slowly increases from 0% to 100% of the light intensity (soft start) to avoid stress in the restorative material.

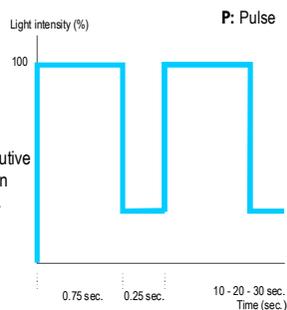


**LONG mode (9 min.)** suitable for long work and bleaching. There is audible signal every 1 min. The curing light works continuously for 9 min. or until the Start/Stop button is pressed again. In this curing mode light intensity is at maximum level.



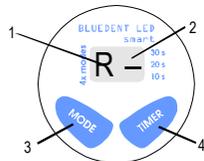
**FAST mode (10 sec.)** - Emitted light has highest intensity - 100% of the light intensity to achieve full hardening of the photocomposite.

**PULSE mode (10 - 20 - 30 sec.)** - There are consecutive light emitting and pause that help to avoid shrinking in restorative material without extending exposure time.



Select exposure time by pressing "TIMER" button repeatedly.

The horizontal line shows selected time - 10, 20 or 30 sec.



(In this example the display shows RAMP curing mode with 20 sec. Timer.)

6. The unit is activated by *pressing* the Start/Stop button of the handpiece. After the unit is activated, countdown timer is seen on the digital display. An audible beeper on every 10 sec is heard.

7. Direct the emitting light of handpiece to the curing spot at the closest distance (4-7 mm) and make sure the lightguide does not touch the photocomposite during the first several seconds and after that, when surface layer is hardened enough, the lightguide can touch the photocomposite.

8. After second pressing of the Start/Stop button or after elapsing the pre-selected time (10, 20 or 30 sec) the unit stops. If an additional curing cycle is necessary, the unit may be activated repeatedly. In the end return the handpiece to the charging station.

9. Switching off of curing light in the end of the day shall be done by unplugging of adapter from the wall socket.

#### "SLEEP" FUNCTION

The cordless handpiece is equipped with a "sleep" function to minimize the unit's energy consumption. The handpiece switches to "sleep" mode:

- when it is placed into the charging station and becomes fully charged;
- when it is left unused for approximately 30 sec. outside the charger;

The "sleep" mode can be terminated only by pressing the Start/Stop button. The handpiece display shows the latest selected exposure time.

#### "BEEPER ON/OFF" FUNCTION

This function allows to switch on and off the beeper. Hold MODE button for 5-6 sec., beeper indication appears and beeper is changed automatically to opposite: If beeper is ON - after holding MODE button, OFF will be displayed and beeper will be switched off. If beeper is OFF - after holding MODE button, ON will be displayed and beeper will be switched on.

#### MEASURING LIGHT INTENSITY - option

The light intensity can be reliably determined only with the light intensity meter, situated on the charging station of BLUEEDENT LED SMART. For this purpose clean carefully the test area (the white circle with label "Light Intensity") with a wet cloth, if required. Then place the lightguide on the test area so that the light emitting opening of the rod is level with the test area. Activate the lamp by pressing the Start/Stop button.

The number of the illuminated LEDs indicates the measured light intensity:

- 4 LEDs illuminated - 100% - 3 LEDs illuminated - 80%
- 2 LEDs illuminated - 60% - 1 LED illuminated - 40%

The measured light intensity differs depending on the selected curing mode during measurement. The light intensity in different curing modes must be:

- R - RAMP** - 3 LEDs are ON, illuminating consecutively.
- L - LONG** - 4 LEDs are ON.
- F - FAST** - 4 LEDs are ON.
- P - PULSE** - 3 and 4 LEDs are ON repeatedly.

*We recommend that light intensity is measured in FAST curing mode. If the light intensity is below 80% (fewer than 3 LEDs are ON), charge the handpiece and check the lightguide for stuck restorative material or mechanical defects.*

#### **BATTERY MAINTENANCE, CHARGING AND REPLACEMENT**

- The cordless handpiece is equipped with electronic charging control that ensures optimal battery charge and helps avoid overcharging.
- Never place the handpiece in the charging station without the battery inserted in the handpiece!
  - When working with BLUEIDENT LED SMART for the first time, the cordless handpiece must be charged at least 10 hours.
  - In regular work, the cordless handpiece is fully charged for approximately 120 min.
  - During the day, between work, put the handpiece in the charger.
  - If, during work, the battery becomes out of charge, the countdown timer blinks and after that the display shows "Lb" (Low Battery). In this case place the handpiece in the charging station for charging.
  - LED indicator **CHARGE** is illuminated when handpiece is put on the charging station. While charging, there are 3 lines blinking consecutively on the handpiece display. When charging is complete, a long beep is heard and for 30 sec. there are 3 blinking lines on handpiece display. After that the handpiece enters "sleep mode".
  - **Use only original BLUEIDENT LED SMART Li-Ion batteries (height 65 mm, diameter 18 mm), 3.7 V, 2400 mAh.**
  - To replace the Li-Ion battery: Unscrew the bottom lid of the handpiece and carefully remove the contact electronic board, remove the coupling and pull the battery out, slightly opening the plastic parts of the handpiece. Install new battery in reverse order.
  - If the handpiece is not to be used for an extended period of time, fully charge the battery before storage and remove battery from handpiece.
  - The charging contacts of the cordless handpiece and charging station must not be contacted by metallic or greasy objects.
  - Do not use any other chargers to charge BLUEIDENT LED SMART handpiece different from the original charging station in the set.
  - The battery must not be immersed in water or thrown in fire.
  - When discarding old battery, observe environment protection rules!

#### **OVERHEATING PROTECTION**

BLUEIDENT LED SMART is equipped with system for overheating control. If the temperature of the LED source reaches 50 degrees C (122 degrees F), the countdown timer blinks and after that the display shows "Oh" (Overheating). After the exposure cycle is completed, the curing light goes off. In this case place the handpiece in the charging station and as soon as it cools down to 40 degrees C (104 degrees F), the work can be continued.

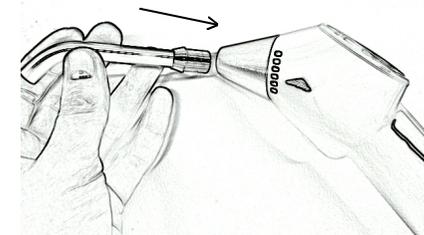
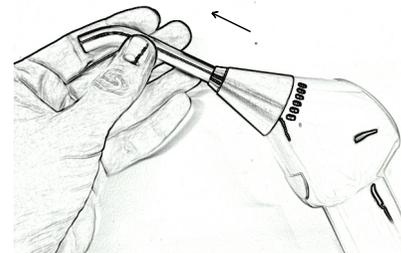
#### **VI. ROUTINE CARE AND MAINTENANCE**

##### 1. Examining of lightguide / protection cap.

Lightguide is mounted / dismantled by pulling (can be rotated).

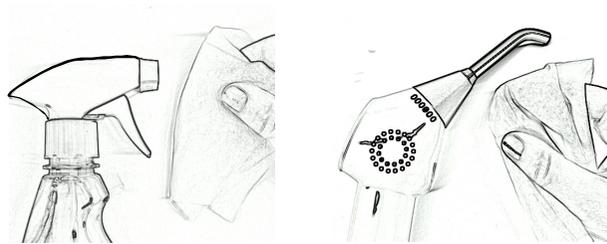
Every day the lightguide tip should be examined for:

- stuck restorative material (it should be removed very carefully with blunt non-metal object);
- mechanical damages on the lightguide. It should be sterilized by autoclave at 134° C for 5 min. The same must be done for protection cap.

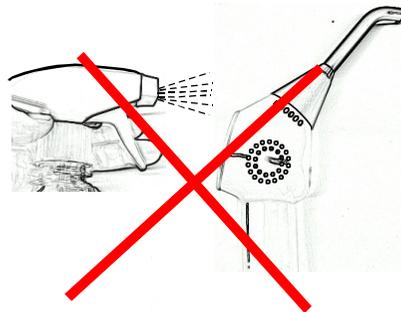


## 2. Cleaning of the unit.

For disinfection of the unit, spray the disinfection agent onto a piece of soft cloth / cotton and clean the handpiece and power adapter. Do not use abrasives or solvents as these may damage the plastic parts of the unit!



Do not spray directly onto handpiece or in button / charge connector!



## 3. Infection control

To prevent cross-contamination, it is recommendable to use a disposable barrier sleeve over the handpiece for each patient.

## **VII. WARRANTY CONDITIONS**

1. Warranty period of the BLUEDENT LED SMART curing light is 24 (twenty four) months from the date of purchase. If date of purchase is not written, warranty starts at date of production.
2. During the warranty period the replacement of the defective parts (except for lightguide; LED module and battery - 6 months warranty) is done free of charge by manufacturer's service.
3. If during the guarantee period the unit is damaged, due to incorrect operation

(mechanical, chemical, thermal or electrical damages), damage caused by improper use, storage or any other reasons in user's fault, the repair is paid by the user.

If any damage is noticed on electric cables, the device must be brought immediately to manufacturer's service. The device must not be used if cables are damaged.

If liquids, such as water and solvents, aggressive or flammable substances and their vapors, also pouring or wiping the device with the same, insects or rodents have entered the device, it must be brought immediately to manufacturer's service. In such cases warranty is lost.

Damages and claims are not accepted due to electric shocks, thunder storms, non-following of measures for electric safety or insufficient protection of patients, personnel or outer persons toward light irradiation.

The manufacturer does not owe compensation for lost benefits in cases of defects or imperfect functioning of the device regardless of the cause.

No claims and damages are accepted due to incorrect security and attention for protection during transportation, unpacking, moving, work and preservation of device. Warranty becomes null and void if any of the above mentioned happens.

If a dispute arises on the application and interpretation of this Operations guide, it shall be solved according to the applicable laws in Republic Bulgaria, and the court of Plovdiv shall be the court of jurisdiction.

4. This warranty becomes null and void if any repair to or servicing of the product is performed by any unauthorized party or if other than original BLUEDENT LED spare parts are used therefore.
5. The manufacturer recommends that the users check once a year (or if there is an incident immediately) in the manufacturer's service if the parameters: output light intensity and heat radiation of their units are in the admissible range. This check-up is done free of charge in the manufacturer's service.
6. The warranty servicing is performed at the manufacturer's service at the following address:



155 Vasil Aprilov Blvd.  
 4027 Plovdiv  
 Bulgaria  
 tel./fax.: +359 32 641913 , +359 32 644089  
 e-mail: office@bglight.com  
 http://www.bglight.com

**VIII. BLUEIDENT DATA**

|                            |                      |
|----------------------------|----------------------|
| <b>SN:</b>                 | <input type="text"/> |
| <b>LOT:</b>                | <input type="text"/> |
| <b>DATE OF PRODUCTION:</b> | <input type="text"/> |
| <b>QC:</b>                 | <input type="text"/> |
| <b>DATE OF PURCHASE:</b>   | <input type="text"/> |



**IX. SYMBOLS**



Manufacturer  
 BG LIGHT LTD, 155 Vasil Aprilov Blvd., 4027 Plovdiv, Bulgaria



Pursuant to Directive 2002/96/EC, this symbol shows that the product must not be disposed of as urban waste at the end of its operating life.



Pay attention to the instructions accompanied by this symbol.



Fragile!



Product with CE mark.



Applied part type BF



The device is equipped with double electric insulation (Class II)

- $\Omega$  Ohm (electric resistance unit)
- s Second (time unit)
- W Watt (power unit)
- Hz Hertz (frequency unit)
- mm Milimeter (length unit)
- A Amper (electric current unit)
- V Volt (electric voltage unit)
- Pa Pascal (atmosphere pressure unit)
- $^{\circ}\text{C}$  Degrees Centigrade (temperature unit)
- g Gram (weight unit)



Serial number



LOT

**X. SERVICE DATA**