LABORATORY INSTRUCTIONS

AUSTROMAT®
µSiC®

HIGH-TEMPERATURE FURNACE FOR DENTAL LABORATORIES

DEKEMA
DENTAL-KERAMIKÖFEN

Version 05/2008

Exclusion of liability

Although we have reviewed the contents of this document to determine its correspondence with the described hardware and software, some differences may exist. We assume no liability for complete agreement. The information in this document is regularly reviewed. The necessary corrections appear in subsequent editions.

We reserve the right to make changes

Table of Contents

1.   Usage, data

1.1.   Introduction

Dear Customer,

You are in possession of a new, exceptional AUSTROMAT[®] µSiC® firing furnace. DEKEMA's many years of experience in the field of firing furnace construction have gone into this equipment ensuring a very high level of quality, and exceptional performance and reliability. In order to take full advantage of the possibilities your firing furnace offers to obtain superior results, we would like to ask you to spend a little time studying these instructions.

The technical data and description of the usage of the firing oven can be found in section 1, Usage, data. Before you start working with the firing furnace: It is essential that you read section 2, Safety to prevent harm to individuals and property. Section 3, Construction and function, provides a short description of the firing furnace and its USB terminal. How to set up and start the firing furnace is described in section 4, First startup. The operation of the firing furnace is explained in section 5, Use, from the first steps to the creation of firing programs. Practical examples and tips will help you identify the sources of troubles and assist you in eliminating them. For your firing oven to function well over a long service life, please follow the instructions for service and maintenance in section 6, Maintenance and Service. Finally, the index enables you to quickly find specific functions of the commands.

1.2.   Proper use

The AUSTROMAT® µSiC® firing furnace was designed for firing dental ceramic objects. In every task that you perform with the firing furnace, observe the safety instructions in the section Safety.

Every use , that goes beyond these instructions is held to be improper and can cause serious personal or property damage. We assume no guarantee when the device is improperly used handled or not used according to instructions. DEKEMA assumes no liability for damages that are thereby incurred.

In particular, materials may not be heated that may trigger explosions, implosions and hazardous or hazardous or flammable gases.

Proper use also includes the following:

- Reading and following these instructions for use,

- Observing the technical data (see section 1.5),

- Performing service tasks in a timely manner (see section 6).

1.3.   Scope of delivery

The following components are included in the delivery of the firing furnace:

- AUSTROMAT® µSiC® firing furnace with power cable,

- Insulation table,

- Graphic user terminal (USB terminal),

- Operating instructions,

- Packaging material:
  - Cardboard boxes,
  - Foam material for protecting against impacts,

- Carrying strap.

Ensure that all components have been supplied, and that the equipment has not suffered any visible damage in transport. If this is not the case, please immediately contact your service partner. Please store the packaging in case you need to ship the equipment at a later date.

1.4.   Rating plate

The information on the rating plate describes the firing furnace and also offers potential customer-specific adaptations. In all correspondence with DEKEMA, please indicate all of the data that is on the rating plate.

The rating plate is on the right side of the firing furnace.

Fig. 1- 1   Example of rating plate

1.5.   Technical Specifications

The technical data of the firing furnace are summarized in the following table. The cited connection values and tolerances must be maintained for the firing furnace to operate properly and for the warranty to take effect.

Dimensions and weight

- Dimensions: 42 x 98 x 60 cm^3 (width x height x depth)

- Weight: 75 kg

Electrical supply data

NOTE:
Only use fuses with the indicated lag and nominal current.

- •Connection voltage: Supply voltage (country-specific, automatically recognized by the firing furnace):

                                  100…240 V AC/50 – 60 Hz

- Fuses: 2 x 16 A   T   500 V or 250 V

Performance data

- Power consumption: max. 2 kW, adjustable

- Firing temperature: max. 1600°C

Interfaces

- USB interface,

- Network interface,

1.6.   Ambient conditions

NOTE:
The firing furnace should not be operated for some time after sudden change of ambient temperature as otherwise condensation may occur in the electronic components, thus causing damage.

The data for the ambient temperature and humidity are designed for conditions at sea level.

- During operation:
  - Temperature: +15°C … +35°C
  - Humidity: max. 60 %, non-condensing

- When not operating and during storage:
  - Temperature: +10°C … +50°C
  - Humidity: max. 80%, non-condensing

- During Transport:
  - Temperature: -10°C … +55°C
  - Humidity: max. 80%, non-condensing

2.   Safety

2.1.   This section must be read!

Read this entire section before you start working with the firing furnace! It contains important instructions for your personal safety. This section must be read and understood by all persons who work with this firing furnace in any phase of the product life of the AUSTROMAT® µSiC® to prevent damage to persons and/or material.

2.2.   Organization of the safety instructions

The following safety instructions refer to various hazard levels.

	⚠ DANGER
⚠	**DANGER identifies a direct, high risk hazard that can cause death or serious bodily injury if it is not avoided.**

	⚠ WARNING
⚠	**WARNING identifies a potential, medium-level hazard that can cause death or serious bodily injury if it is not avoided.**

	⚠ CAUTION
⚠	**CAUTION identifies a low-risk hazard that can cause slight or moderate bodily injury or property damage if it is not avoided.**

NOTE:
A note such as this refers to particularly important information that, however, does not concern safety.

2.3. General safety regulations

2.3.1. Operating instructions

Read and understand
Anyone who works on or with the AUSTROMAT® µSiC® firing furnace in any phase of the product life must read these instructions for use and understand them. This concerns in particular chapter 2: Safety.

Storage
The operating instructions are delivered along with the firing furnace and are considered an essential component of the product. They must be stored with the firing furnace in a highly visible location and be directly accessible. You can order of additional copies of the operating instructions from DEKEMA (see page 2).

Completeness
Always use the complete original version of these operating instructions. The instructions in the operating instructions contain cross-references to other sections containing important information. Incomplete copies or copies of individual pages can not provide all the necessary information of the operating instructions.

	⚠ **WARNING**
⚠	**Incomplete operating instructions.**
	A lack of safety instructions due to incomplete operating instructions can cause serious injury and property damage.
	Always perform work with a complete copy of the operating instructions. Do not copy individual pages.

2.3.2.   Operation

Use

The AUSTROMAT® µSiC® firing furnace may only be used for its intended purpose. (see section 1.2). All instructions and procedures that can affect the safety of persons or the firing furnace are forbidden. The branch-specific and local regulations concerning accident prevention must be observed.

Condition

The firing furnace may only be operated when it is functioning properly. Observe the technical data in section 1.5.

If the firing furnace can no longer be operated safely, immediately unplug it and prevent it from being unintentionally operated. Reasons for assuming that the equipment cannot be used safely:

- The error message "TEMPERATURE THRESHOLD EXCEEDED! ",

- Visible damage to the housing or power cable,

- Malfunctions,

- Frequently required fuse changes,

- Long storage in a problematic environment (moisture, see section 1.6).

Safety stickers

Safety stickers are affixed to the firing furnace and provide notification of residual danger. The safety stickers may not be removed. They must be replaced if they are lost or are no longer clearly legible.

Workplace

The operator must provide corresponding instructions and inspections to ensure order and cleanliness of the workplace and the surroundings of the AUSTROMAT® µSiC® firing furnace.

Waste

If polluting waste arises from use, the operator is responsible for the proper disposal.

2.3.3.   Maintenance and Service

Replacement parts

<table>
<tr>
<td rowspan="2">⚠️</td>
<td>⚠️ **WARNING**</td>
</tr>
<tr>
<td>

Non-original replacement parts.

Malfunctions can arise if third-party parts are used. In certain circumstances, this can cause serious injury and substantial property damage.

Always use original replacement parts from DEKEMA (see section 6.4).
</td>
</tr>
</table>

Retrofitting
Independent retrofitting and changes that affect the safety of the firing furnace are forbidden.

2.3.4.   Disposal

The operator must carefully dispose of the firing furnace in accordance with regulations. He can give it to a licensed, private or public collection facility, or recycle it or dispose of it himself (see section 7.2).

2.4.   Danger

Observe the following hazard instructions in all of your jobs with the firing furnace.

	⚠ **DANGER**
⚡	**Electrical shock from voltage-conducting parts.** **The firing furnace is operated using mains voltage. Death may result due to electrical shock from touching voltage-conducting parts.** **Observe the following instructions:** • **Never contact voltage-conducting parts,** • **Do not use your hands or any objects to grasp things in the firing chamber,** • **Maintenance and service jobs may only be performed when a device is not powered. Turn off the firing furnace, and pull the power plug,** • **The protective conductor (inside and outside of the unit) must always be safe for operation and may never be disabled. The connection may never be intentionally severed.**

NOTE:
Only personnel with electrotechnical training and experience handling devices that operate on mains voltage may perform work on the electrical components.

	⚠ **WARNING**
🔥	**Fire hazard.** **The firing chamber can reach temperatures above 1,000°C during operation. Heat-sensitive materials close to the firing furnace can easily ignite and cause a fire.** **Observe the following instructions:** • **Never operate the firing furnace without the insulation table being mounted,** • **The vent holes in the cover of the firing chamber must be unobstructed,** • **Make sure that flammable materials (such as cleaning alcohol, wiping cloths, etc.) or objects that can be damaged by heat are sufficiently distance from the firing furnace.** • **Never operate the firing furnace without supervision.**

	⚠ **WARNING**
	Hot surfaces. **The firing chamber can reach temperatures above 1,000°C during operation. There is an extreme burning hazard from touching hot surfaces after the firing chamber is opened.** **Never directly contact hot parts of the firing furnace. The firing furnace requires several hours to cool after it is turned off. Observe the following instructions:** • **Do not use your hands or any objects to grasp things in the firing chamber,** • **Do not grasp the lift seat, insulation table, kiln furniture or firing objects with your bare hands,** • **Use suitable tools (tweezers) to remove the firing objects, or wear safety gloves.**

	⚠ **WARNING**
	Heavy firing furnace. **When the firing furnace is transported, there exists the danger of crushing, and the device may become damaged.** **At least two persons must transport the firing furnace. Wear safety gloves. Use the provided carrying strap.**

	⚠ **CAUTION**
	Ceramic dust from insulation materials. **The firing chamber and insulation table consist of ceramic insulating material. Inhaling ceramic dust can be hazardous to your health.** **Do not inhale the dust. To remove ceramic dust, use a suitable vacuum cleaner.**

2.5. Access rights

NOTE:
Ask your vendor or DEKEMA if you have been released for access via a web browser. If this is the case, ask for the supplement to the operating instructions.

Three levels are defined for accessing the control of the AUSTROMAT® µSiC® ceramic furnace through a web browser. Access levels 1 and 2 (see following table) are password-protected. The passwords are defined in the "Service" menu using the "Password" function.

The access rights should be issued to the users of the firing furnace based on their knowledge, experience and responsibility.

The firing oven normally starts in the Operation menu. When General Code is used, it starts one level higher.

Access levels	Description	Password entry
General code (level 0)	A password must be entered for: • Restricted access to the "Setup" menu. • Selecting blocked programs and starting them, • Edit and create unblocked programs, • Unlocking the General Codes.	Not necessary
Operation (level 1)	• Select all programs and start them, • Edit and create all programs, • Access to the "Setup" menu.	Required
Service (level 2)	• Access to the "Service" menu.	Required

Tab. 2-1   Access levels

2.6. Emergency off function

Press the [ON/OFF] key on the graphical user terminal (for the USB terminal, see 3.3). All the commands that the firing oven is executing are immediately interrupted without a query.

3.   Construction and function

3.1.   Front of the device

The following figure shows the front of the AUSTROMAT[®] µSiC® firing furnace and identifies the most important components.

Fig. 3- 1   Front view of the firing oven (example)

1	*Top of oven with firing chamber*	*4*	*Lift rod*
2	*Insulation table*	*5*	*Bottom of furnace with electronics and mechanical parts*
3	*Lift seat with sealing ring*	*6*	*firing chamber cover with ventilation slots*

The top of the firing furnace contains the firing chamber. The firing chamber cover contains ventilation slots for cooling the firing furnace. The area in the back of the housing contains the electronic and mechanical furnace components. used to move the lift system comprising the lift rod, lift seat with sealing ring (O-ring), and the insulation table on which the objects to be fired are placed.

3.2.   Back of the unit

The following figure shows the back of the bottom part of the AUSTROMAT® µSiC® firing furnace and identifies the most important components.
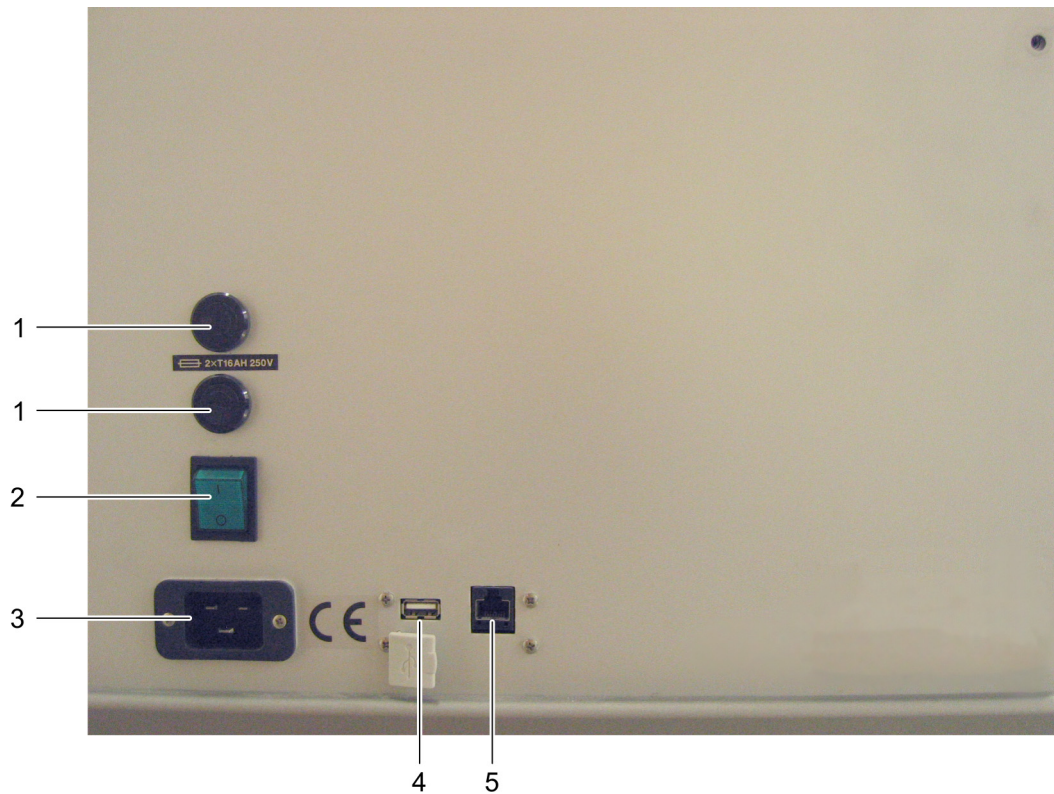
Fig. 3- 2   *Back view of the firing oven (example)*

1	*Unit safety switch*		*4*	*USB interface*
2	*main switch*		*5*	*Network interface*
3	*Connection socket for the power cable*			

The standard equipment on the back of the device comprises:

- Connection socket for the power cable,

- The main switch for turning the device on and off,

- Two fuse holders with integrated fuses (see section 1.5),

- Two interfaces :
  - USB interface for connecting a USB device such as a USB stick, or USB terminal (see section 3.3), USB hub, USB keyboard or USB mouse,
  - A network interface for connecting an Ethernet cable (connecting the firing furnace to a network) or a crossed network cable (for connecting the firing to an individual computer).

3.3.   Graphic user terminal

The graphic user terminal enables restricted use of the firing furnace:

- Turn on and off for the firing furnace,

- Select, start and stop programs,

- Move the lift up and down,

- Open the "Setup" menu. You can select the following functions:
    - Startup routine,
    - Setup for temperature calibration,
    - Network data,
    - Furnace information,
    - Program display.

The graphic user terminal is connected to the firing furnace via the USB interface on the back (see Fig. 3- 2).

Fig. 3- 3   *Graphic user terminal (USB-Terminal)*

1	*Function keys*	*3*	*Switch on/off*
2	*display*		

Note: After the firing furnace is turned on, the control starts. This can take approximately 1 minute. Only then does the display of the USB terminal appear.

Function keys

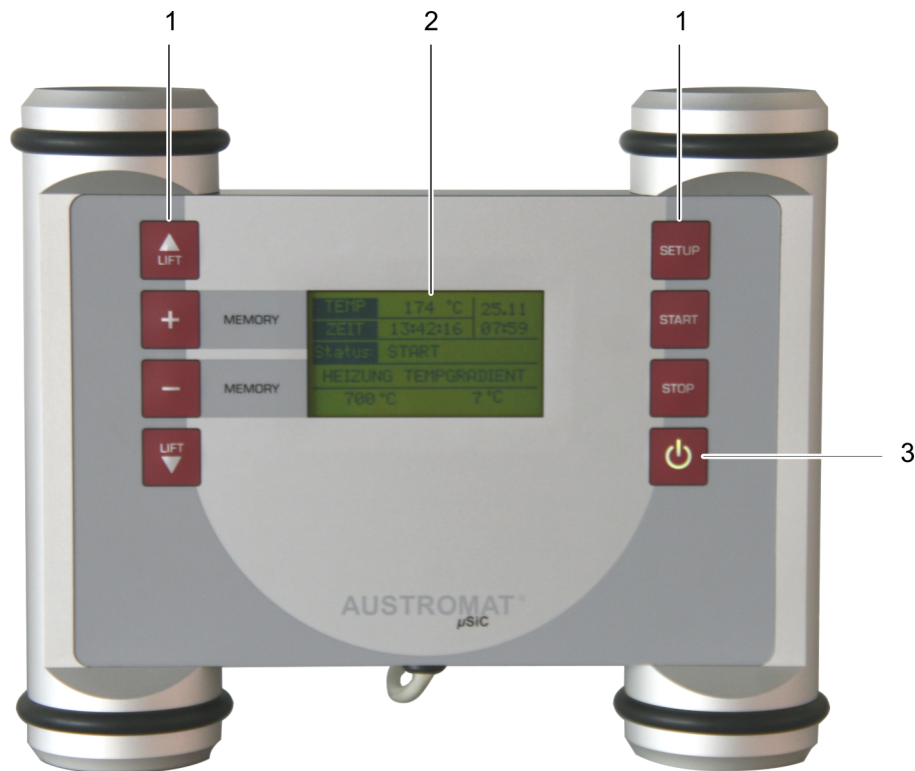You can use the function keys of the USB terminal to execute the basic functions for operating the firing furnace. When the firing furnace is connected to a network or an individual computer and is correspondingly set up (see section 2.5), you can execute these functions using the computer keyboard (note that the USB terminal does not have to be connected to the firing furnace).

Key	Change	Computer keyboard*)	Description
▲ LIFT	[LIFT Up]	[F1]	• Press once: The lift moves upward. • Press again: The lift stops moving. • For the first startup (see section 4.3.2): Selection key, one position up.
+	[MEMORY +]	[F2]	• Advances one position forward in the program memory. • For the first startup (see section 4.3.2): Selection key, one position up.
−	[MEMORY -]	[F3]	• Goes back one position in the program memory. • For the first startup (see section 4.3.2): Selection key, one position down.
LIFT ▼	[LIFT Down]	[F4]	• Press once: The lift moves down. • Press again: The lift stops moving. • For the first startup (see section 4.3.2): Selection key, one position down.
SETUP	[SETUP]	[F6]	By repeatedly pressing the key, you switch between the following modes: • (First) startup. This can also be selected during operation when no firing program is running. You can set different parameters such as the time, or perform a backup. (see section 4.3.2). • Setup for calibrating temperature (set the CCF value). (see section 3.3.2). • Network data with the current addresses. (see section 3.3.3). • Furnace information on the hardware and software. (see section 3.3.4). • Program display of the selected firing program. For the first startup (see section 4.3.2): no function.

Key	Change	Computer keyboard*)	Description
START	[START]	[F7]	• Starts the selected program, see section 5.3. • For the first startup (see section 4.3.2): Confirm the selection (Enter key).
STOP	[STOP]	[F8]	• Prematurely terminates the program; see section 5.3. • For the first startup (see section 4.3.2): no function.
⏻	[ON/OFF]	[F9]	• Emergency off function: Press this to end all current commands. • To turn on and off in standby: Press the key and hold it for about 5 seconds. • For the first startup (see section 4.3.2): no function.

Tab. 3-1   Functions of the USB terminal
 *To use the USB terminal, the function keys on the computer keyboard must be released; see section 2.5

3.3.1.   Program display

The following figure shows the display of the USB terminal with the program display.
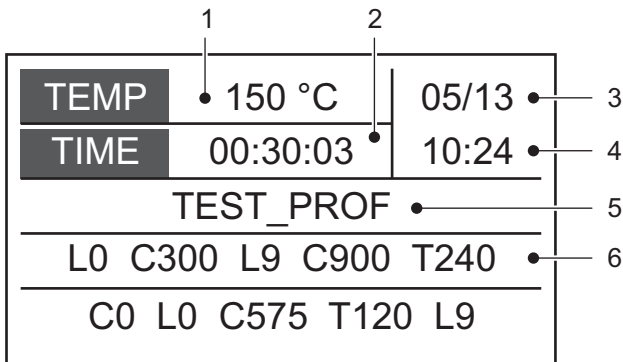
Fig. 3- 4   Program display of the graphic user terminal

Position in Fig. 3- 4	Description
1	Temperature in the firing chamber
2	Provisional duration or residual time of firing program
3	Date of firing furnace control
4	Time of firing furnace control
5	Program name
6	Command lines. Depends on the current menu of the firing oven control: • In the program selection window (if released): Command sequence of the firing program in "CVTL" syntax (first 42 characters) • While the program is running: Current command and its duration or remaining runtime.

Tab. 3-2   Display of the graphic user terminal

3.3.2. Calibrate temperature

NOTE:
DEKEMA that the AUSTROMAT® µSiC® temperature be calibrated annually by the vendor using an external thermocouple.

Repeatedly press the [Setup] key until the setup for the temperature calibration is displayed. The following figure shows the display of the USB terminal with the temperature calibration display.

```
┌──────────────────────────────┐
│            Setup             │
│                              │
│    Temperature calibration   │
│       CCF        1002        │
│                              │
│    [Start]   [Stop] = Esc    │
└──────────────────────────────┘
```
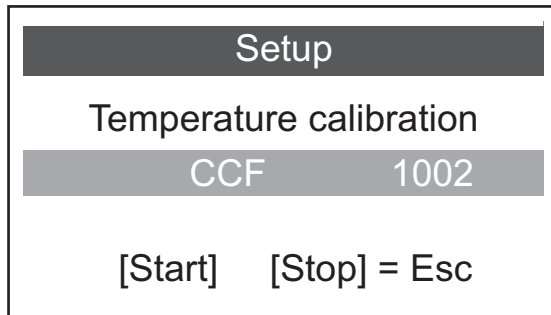
Fig. 3- 5   Display of Setup > Temperature calibration

Change CCF value	•	Press [MEMORY +] or [MEMORY -] until the desired CCF value is displayed.
[START]	•	Starts the temperature calibration program.
[STOP]	•	Closes the display "Setup > Temperature calibration" and returns to the program display. (see section 3.3.1).

3.3.3.   Network data

NOTE:
Consult section 2.5 about connecting the firing furnace with a network.

Repeatedly press the [Setup] key until the setup for the network data is displayed. The following figure shows the display of the USB terminal with the network data.

```
┌─────────────────────────────────┐
│          Network data           │
│                                 │
│  IP:          192.168.002.106   │
│  Subnet:      255.255.255.000   │
│  Gatew.:      192.168.002.001   │
│  Network:        connected      │
└─────────────────────────────────┘
```

Fig. 3- 6   Network data display

Press any key to return to the program display (see section 3.3.1).

3.3.4.   Furnace information

Repeatedly press the [Setup] key until the setup for the furnace information is displayed. The following figure shows the display of the USB terminal with the furnace information.

```
┌─────────────────────────────────┐
│  FURNACE INFORMATION:           │
│                                 │
│  S/N:              001          │
│  SW:           v  00.23b        │
│  PSoC:                          │
│  HW:                            │
│  OS            v  01.01.232     │
└─────────────────────────────────┘
```

Fig. 3- 7   Furnace information display

Press any key to return to the program display (see section 3.3.1).

4.   First startup

4.1.   Unpacking and setting up

	⚠ **WARNING**
⚠	**The firing furnace is heavy.** **When the firing furnace is transported, there exists the danger of crushing, and the device may become damaged.** **Two persons must transport the firing furnace. Wear safety gloves. Use the provided carrying strap.**

Packaging symbols
The packaging is identified with the packaging symbols shown below. The symbols must be followed.
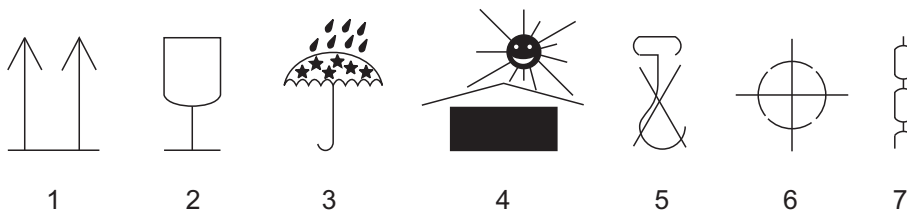
Fig. 4- 1   *Packaging symbols*

1	*Top*	5	*Do not use hooks*
2	*Fragile*	6	*Center of gravity*
3	*Protect from moisture*	7	*Lifting point*
4	*Keep away from heat*		

1.   Remove the packaging, and keep the packaging material for storing the firing oven or for later transport.

2.   Make sure that all of the parts listed in the scope of delivery are in the delivered package; see section 1.3.

3.   Check the delivery for transportation damage. Notify immediately of any complaints.

4.   Transport the firing furnace to the provided setup site (see section 4.2).

NOTE:
It is possible that the firing furnace may not be safe to use when there is visible damage to the housing or power cable.

4.2. Requirements at the setup site

The setup site of the firing oven must meet the following requirements:

- Set up the furnace on a dry, flat, solid surface.

- The surface must be able to bear the weight of the firing furnace (see section 1.5).

- Materials and objects that can be damaged by heat must be sufficiently distant from the firing furnace.

- The vents in the firing furnace must not be obstructed to enable the circulation of cooling air.

- A power socket must be close to the device and easily accessible.

- The conditions in the environment at the setup site must meet the requirements in section 1.6.

4.3.   First startup

NOTE:
When connecting the firing furnace:
- **The firing furnace is operated using mains voltage. The country-specific mains voltage (100 V…240 V) is automatically recognized.**
- **Use only suitable power sockets with ground contacts, and never use adapter plugs.**
- **Do not run the connection lines past places of the firing furnace that are hot, and especially avoid direct contact.**

1.   Make sure that the firing furnace is turned off. The ON/OFF switch is on the back of the furnace (see section 2.5).

2.   If you want to operate the firing furnace through a network (Ethernet): Connect a network cable to the interface on the back of the furnace (see section 2.5).

3.   If you want to operate the firing furnace with a computer (Ethernet): Connect a crossover network cable to the interface on the back of the furnace (see section 2.5).

4.   Plug in the power cable into a power socket with a ground contact.

5.   Turn on the firing furnace. The control of the firing oven starts up over a period of about 1 minute. The firing furnace performs an internal software and hardware check, and the lift moves down automatically.

6.   Perform the steps for the first startup of the firing oven using the USB terminal (see section 4.3.2).

7.   If necessary: Remove any ceramic dust from the lift seat and the sealing ring. Brush the dust into a receptacle. Do not blow away the dust, and do not inhale it.

8.   There are three different ways to operate the firing furnace (control software):
   - Operation using the USB user terminal (see section 3.3).
   - Operation using a network computer: Connect the firing furnace to the network (see section 2.5).
   - Operation using an individual computer: Connect the firing furnace to the computer (see section 2.5).

4.3.1.   Installation assistant

The installation assistant is optionally available and is activated at the plant before delivery. The installation assistant asks you to mount the insulation table, and runs an installation routine after you confirm by pressing the [CONTINUE] key. The firing chamber is dried, and the firing furnace is checked. The installation routine takes approximately three hours, and can be terminated at any time with the [ABORT] key. The installation assistant is started each time the furnace is turned on until the entire installation routine has run once.

4.3.2.   First startup with the USB terminal

After the firing furnace is turned on, the control starts. This can take approximately 1 minute. Only then does the display of the USB terminal appear with the startup menu. You can find a description of the keys and functions in section 3.3.

NOTE:
You can leave the startup routine for the USB terminal only by confirming the set parameters (repeatedly press the [START]) key.

1.   Start the startup routine: Press [START].

```
┌─────────────────────────────┐
│      STARTUP ROUTINE        │
│     Do you want to start    │
│        the routine?         │
│                             │
│      [Start]  =  YES        │
│      [Setup]  =  No         │
└─────────────────────────────┘
```
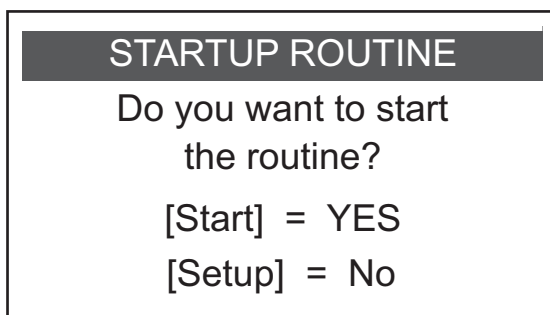
Fig. 4- 2   Start the startup routine

2. The menu for selecting the language appears in the preset language (generally in the respective national language). The "English" language has a gray background.
Use the selection keys ([Up], [Down], [+], [-]) to choose the desired language. Confirm your selection with [START].

```
┌─────────────────────────────┐
│      STARTUP ROUTINE        │
│      language selection     │
│ ┌─────────────────────────┐ │
│ │        English          │ │
│ │        Deutsch          │ │
│ │        Español          │ │
│ └─────────────────────────┘ │
│  + ↑   − ↓       [Start] = Ent │
└─────────────────────────────┘
```
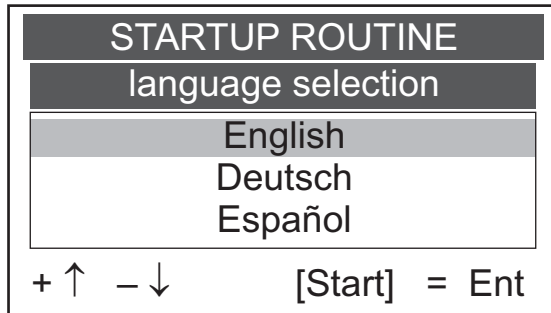
Fig. 4- 3   Select language

3. The request "Mount the insulation table" appears. Mount the insulation table if applicable, and confirm with [START].

```
┌─────────────────────────────┐
│      STARTUP ROUTINE        │
│      Insulation table       │
│                             │
│   Place the insulation table │
│     onto the lift plate!    │
│                             │
│          [Start]  = Ent     │
└─────────────────────────────┘
```

Fig. 4- 4   Mount the insulation table

4. Set the date for the firing oven control. Note: If the language "English" is set, the American date format is automatically used.

    a. The setting for the day "DD" flashes. Use the selection keys to set it, and confirm with [START].

    b. The setting for the month "MM" flashes. Use the selection keys to set it, and confirm with [START].

    c. The setting for the month "YY" flashes. Use the selection keys to set it, and confirm with [START].

```
┌─────────────────────────────────┐
│        STARTUP ROUTINE          │
│        Setting the date         │
│                                 │
│          DD : MM : YY           │
│          13 : 05 : 08           │
│                                 │
│  + ↑  − ↓      [Start]  =  Ent  │
└─────────────────────────────────┘
```
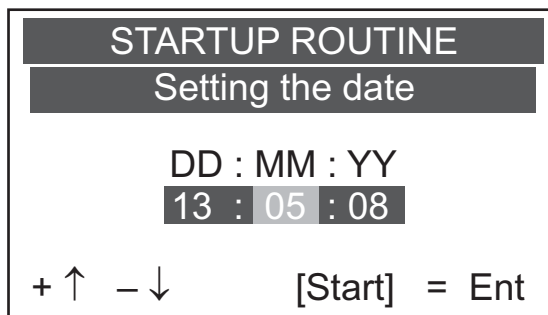
Fig. 4- 5   Set date (example: month)

5. Set the time for the firing oven control. Note: If the language "English" is set, the American time format is automatically used.
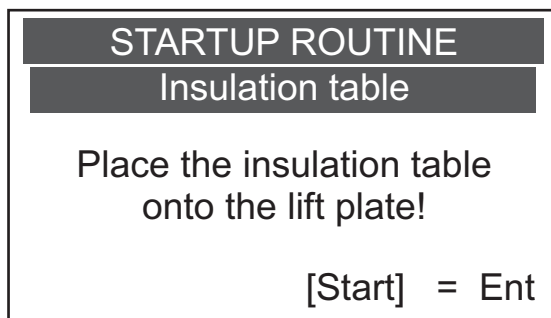
    a. The setting for the day "HH" flashes. Use the selection keys to set it, and confirm with [START].

    b. The setting for the minutes "MM" flashes. Use the selection keys to set it, and confirm with [START].

```
┌─────────────────────────────────┐
│        STARTUP ROUTINE          │
│        Setting the time         │
│                                 │
│            HH : MM              │
│            08 : 44              │
│                                 │
│  + ↑  − ↓      [Start]  =  Ent  │
└─────────────────────────────────┘
```

Fig. 4- 6   Set time (example: hour)

6. Set the IP address . You can only edit the last three characters using the USB terminal; they will flash. Use the selection keys to set it, and confirm with [START].
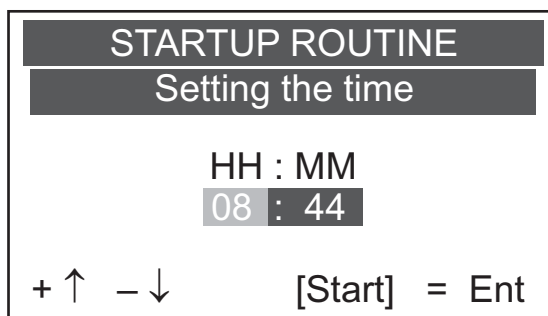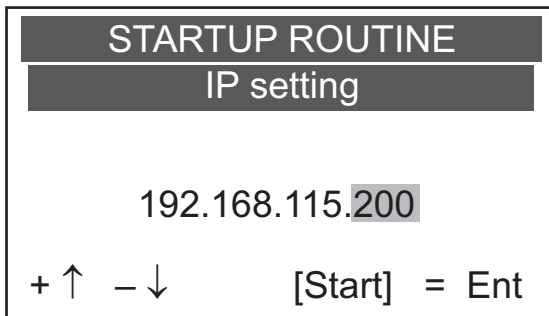
```
┌─────────────────────────────┐
│     STARTUP ROUTINE         │
│        IP setting           │
│                             │
│                             │
│      192.168.115.200        │
│                             │
│  + ↑  − ↓      [Start]  = Ent│
└─────────────────────────────┘
```

Fig. 4- 7   Set IP address

7. A request for a USB backup appears. You can use the USB stick to start the firing oven including the saved operating system, software, previously set parameters and firing programs. Use the selection keys "yes" or "no" to select it (default: no), and confirm your selection with [START].

8. If you select "Yes", the following request appears: Unplug USB terminal. Insert USB stick. After the acknowledgement beep, plug in USB terminal again."
    *   If the USB stick is full or not available, the error message "ERROR USB Stick" appears. Confirm by pressing [START]. The request for a USB backup appears again.
    *   If the USB stick was described, then "OK" appears. Confirm by pressing [START].

9. Turn the "Backlight" on or off. Use the selection keys "ON" or "OFF" to select it (default: current value), and confirm your selection with [START].

```
┌─────────────────────────────┐
│     STARTUP ROUTINE         │
│        Back light           │
│       Illumination          │
│       USB terminal          │
│           ON                │
│  + ↑  − ↓      [Start]  = Ent│
└─────────────────────────────┘
```
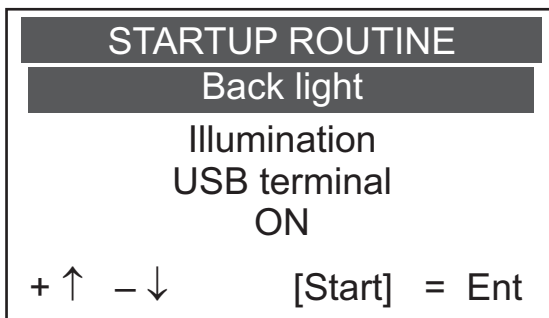
Fig. 4- 8   Turn the backlight on and off

10. The installation assistant starts (see 4.3.1).
- Press [START] to start the installation routine. After it ends, the window with the diagnostic data appears. Press a key to display the program of the previously selected firing program.
- [STOP] switches you from the startup routine to the display of the previously selected firing program.

```
┌─────────────────────────────────────┐
│ STARTUP ROUTINE                      │
│                                      │
│                                      │
│         Start-up routine             │
│                                      │
│                                      │
│    [Start]    [Stop]  =  Esc         │
└─────────────────────────────────────┘
```
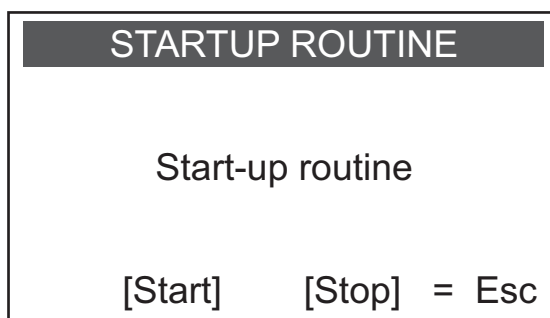
Fig. 4-9   *Start first startup*

The first startup with the USB terminal is over.

5.   Use

NOTE:
When using the firing furnace, observe section 2, Safety.

5.1.   Turning on and off

NOTE:
Never operate the firing furnace without supervision.

Preparations
Check the following:

- if the AUSTROMAT® µSiC® is connected by a power cable to a socket with a protected contact (see section 3.2),

- an input device is connected to operate the AUSTROMAT® µSiC®:
  - graphic user terminal (USB terminal) (see section 3.3) or
  - Web interface via an individual computer or network connection (see section 2.5).

Switching on

- Turn on the firing furnace:
  - Main switch on the back of the firing furnace: The control of the firing oven starts up over a period of about 1 minute. The firing furnace performs an internal software and hardware check, and the lift moves down automatically. On/Off switch in standby on the USB terminal: If the firing furnace is already in standby and the USB terminal is plugged in. The firing furnace is ready for use.

- Make sure that the insulating table is mounted on the lift seat. If not: Turn the firing furnace off, and mount the insulating table. Then turn on the firing furnace again.

Switching off

- Close the firing chamber before switching off the firing furnace to avoid unnecessary condensation in the ceramic furnace.

- Turn off the firing furnace:
  - Main switch on the back of the firing furnace, or
  - On/Off switch in standby on the USB terminal.

5.2. Mounting and removing a firing object

⚠️ 🧤	**⚠ WARNING** **Hot surfaces.** **The firing chamber can reach temperatures above 1,000°C during operation. There is an extreme burning hazard from touching hot surfaces after the firing chamber is opened.** **Never directly contact hot parts of the firing furnace. The firing furnace requires several hours to cool after it is turned off. Observe the following instructions:** • **Do not use your hands or any objects to grasp things in the firing chamber,** • **Do not grasp the lift seat, insulation table, kiln furniture or firing objects with your bare hands,** • **Use suitable tools (tweezers) to remove the firing objects, or wear safety gloves.**

Mounting the firing object

• Place the firing object on the firing tray, and place the firing tray in the middle of the insulation table.

• When positioning the firing object and firing tray, ensure that no parts jut out over the edge of the insulation table. There is a danger of damaging the firing object and thermal insulation material when closing the firing furnace.

Fig. 5- 1   *Mounting the firing object*

• The height of the firing tray including the firing object may not exceed 15 centimeters.

Removing the firing object

• Use suitable tools (tweezers) to remove the firing objects, or wear safety gloves.

5.3.   Select programs and start them

You can find a description of the USB terminal in section 3.3.

1.   Scroll through the program memory with [MEMORY +] and [MEMORY -] until the desired program list is displayed.

2.   Press [START] to start the program. The program is processed automatically.

3.   While the program is running, the lift automatically moves up and down. Make sure that no objects are in the way that could hinder the lift movement. Also do not attempt to manually stop or accelerate the lift.

4.   While the program is running, you can stop the program by pressing [STOP]. In this case, the USB terminal asks you if you really want to end the program.

5.   Use the [ON/OFF] key to stop the program or a running function immediately without a query (emergency off function; see section 2.6).

5.4.   Some practical tips

5.4.1.   General operation of the furnace

Lift noise
After switching on the firing furnace, the lift moves down and performs automatic lift calibration. The brief buzzing noise is due to technical reasons and is completely normal. Please note that the firing furnace does not react to any commands during this calibration time.

Automatic heating (optional)
The firing furnace automatically heats to the temperature required to start the next program when standard and professional programs are selected. In general, it occurs when the firing chamber is open.

Save energy
Close the firing chamber in the event of prolonged breaks between firings. This saves energy and prevents unnecessary wear of the heating element. In addition, you do not unnecessarily overheat the cover plate – the firing furnace reminds you.

Condensation
Close the firing chamber before switching off the furnace to avoid unnecessary condensation in the firing furnace.

5.4.2.   Heating element

The heating elements are wear-sensitive parts whose service life depends on how much it is used. Running the check program regularly makes it easier to identify the correct time to replace a heating element. Another way of identifying heating element wear is visual inspection. Look into the open firing chamber from below while the firing furnace is switched off and cold. If the heating strips are deformed or there is strong glass formation, the heating element should be replaced.

5.4.3.   Thermocouple temperature calibration

Visually inspect the thermocouple regularly - particularly before temperature calibration - while the firing furnace is cold and switched off and the firing chamber is open. A mirror held at an angle under the firing chamber can be very helpful. The thermocouples are attached to the middle of the back within the firing chamber and jut out horizontally into the firing chamber. Ensure that they are not bent since this influences temperature measurement and hence the firing results.

5.4.4.   Programming and program steps

Drying the firing object
The insulation table is still very hot immediately after firing. The temperature near the firing object may thus be too high for drying. Wait a few minutes until the insulation table has cooled down before placing the new firing object on the insulation table for drying.

Standby temperature (optional)
Do not worry if the firing furnace sets a stand-by temperature in the firing chamber that is lower than the preheating temperature. If a drying time has been programmed, the furnace automatically sets a temperature in the firing chamber that is necessary for the drying.

Cooling and relaxing (optional)
In the program steps "Cooling" and "Relaxing" (easy programs), the respective temperature is approached as fast as possible. The firing chamber is opened in order to move the firing goods out of the hot firing chamber. Since the firing chamber then cools, the fired materials are subjected to less radiated heat than corresponds to the cooling temperature. To offset this effect, the lift moves up slightly closer to the hot firing chamber. When the firing chamber has reached cooling temperature, the lift should be completely at the top, and the firing chamber should be closed again. This ensures that the fired materials are always approximately subjected to cooling temperature during the cooling time.

5.4.5.   Firing programs

Firing tray und kiln furniture
Every type of firing tray and kiln furniture has an effect on the temperature of the firing object due to its color and composition. Using a standardized firing tray can thus ensure constant firing results. Ensure the quality of the firing tray and kiln furniture. Deformation at high temperatures, minimum shrinkage and thermal shock resistance are parameters affecting quality.

Firing parameters and test firings
Care in creating firing programs and editing firing parameters has a significant effect on the quality of firing results. The recommended firing parameters are thus to be seen only as guidelines. Perform test firings to identify your individual firing parameters based upon these guidelines.

5.5. Saving and restoring data

You can back up or restore all the data for the firing oven control (saved operating systems, software, set parameters and firing programs) in the startup routine (see section 4.3.2).

NOTE:
For reasons of data safety and to prevent the loss of firing oven data, it is recommendable to regularly back up all your data.

5.6. After a power failure

NOTE:
If a running program is interrupted by a temporary power failure (less than 2 hours), the firing furnace attempts to properly terminate the program when the power comes back on. The quality of the firing results is not guaranteed in this case. Make sure to take particular care to inspect the firing results.

After a power failure, the control remembers the status of the firing furnace at the time of the interruption for up to two hours.

- If the power comes back on within two hours, the firing furnace returns to the status at the time of the power failure. A firing program is continued if the temperature drop in the firing chamber does not exceed 150°C.

- Otherwise, the AUSTROMAT® µSiC® asks you if you want to continue the program.

6.   Maintenance and Service

	⚠ **WARNING**
⚠	**Non-original replacement parts.** **Malfunctions can arise if third-party parts are used. In certain circumstances, this can cause serious injury and substantial property damage.** **Always use original replacement parts from DEKEMA.**

NOTE:
When performing all maintenance and service tasks observe section 2, Safety.

If technical servicing or repairs are necessary, they should only be performed by authorized professionals.

NOTE:
After the ceramic furnace has been serviced, check for safety:
- **Federal Republic of Germany: VDE 0701,**
- **International: According to the legal requirements of your own country.**

6.1.   Care

NOTE:
Before each maintenance and service task: Read section 2, Safety. In particular, be aware of the hazards listed in section 2.4.

- Clean the housing and control elements with a soft cloth moistened with a mild cleanser. Do not use scouring agents, scouring pads or solvents such as alcohol, gasoline or acetone.

- Always keep the sealing ring of the lift seat free of dust to ensure a reliable seal. Use a brush with a receptacle (for ceramic dust), or a moist cloth.

6.2.   Check program

The AUSTROMAT® µSiC® has an internal program that checks the function of the major components: the check program. Regularly running in this unchangeable program makes it easier on you and the responsible service personnel

- to identify old components such as heating element wear,

- and eliminates malfunctions.

Start check program
After approximately 500 firings, the device will display a recommendation on the screen to start the self-check program (this takes approximately 180 minutes depending on the maximum rise rate).
You can start the "Check program" during the startup routine (see section 4.3.2).

Results of the check program
The results of the self-check are saved in a diagnosis file. If the diagnostic data reveal that a firing program may not be able to be processed correctly, then the AUSTROMAT® µSiC® automatically points this out when a firing program is started. This is the case for example when the heating element is too old, and you want to reach a firing temperature quickly.

Error messages after running the check program

Error message	Measures
1. "NO ERRORS FOUND"	No errors were found.
2. 'CHANGE HEATING ELEMENT"	Contact your service partner (see section 6.4).

Tab. 7-1   Overview of error messages

The error message "CHANGE HEATING ELEMENT" can also arise when the heating element is technically functional. However, the check program requires a nominal power supply to operate. When the power supply is below the nominal value, the error diagnosis of the heating element can be incorrect. This problem generally only occurs in Asian countries. Consult your local power company.

6.3. Change the heating element

NOTE:
Before each maintenance and service task: Read section 2, Safety. In particular, be aware of the hazards listed in section 2.4.

NOTE:
Only authorized professionals are permitted to perform any technical measures (see 6.4).

Over time, the heating element wears out from use. This can have a negative influence on your firing results. For this reason, change the heating element at the proper time. If the self-check program is run regularly (see section 6.2), a recommendation will be displayed when the heating element wear has exceeded the permissible limit. Follow the accompanying installation and safety instructions in section 2 to install the replacement heating element. Heating elements should only be replaced by trained professionals.

6.4.   Service and Transport

NOTE:
Before each maintenance and service task: Read section 2, Safety. In particular, be aware of the hazards listed in section 2.4.

NOTE:
These operating instructions are part of the documentation for the AUSTROMAT® µSiC® firing furnace. Read the service instructions before servicing.

Service partners
We recommend regular maintenance of the firing furnace by your service partner. This will ensure superior firing results. If wearing parts need to be replaced, contact your responsible service partner. If more extensive repairs to the firing furnace are required, please also contact your service partner.

Replacement parts
Only use original DEKEMA parts for servicing and maintaining the firing furnace. Contact your service partner, or contact DEKEMA directly.

Manufacturer address
Please direct any questions for the manufacturer to the following address:

DEKEMA Dental-Keramiköfen GmbH
Industriestrasse 22
D-83395 Freilassing
Tel. +49-8654-4639-0
Fax +49-8654-66195
E-mail: info@dekema.com
Website: www.dekema.com

Transport

- Turn off to the firing furnace as described in section 7.1.

- To transport the firing furnace, only use the original box and the supplied packaging material.

7.   Storage and disposal

7.1.   Storage

Turn off the firing furnace

⚠️	## ⚠ WARNING
	Fire hazard. **A fire hazard exists when the firing furnace is hot when packaged.** **Let the firing furnace cool for several hours to room temperature with the firing chamber open after turning it off.**

Observe the following procedure:

1.   Turn the firing furnace off, and let it cool to room temperature. Note that the device needs several hours to cool down.

2.   Turn the firing furnace on, and move the insulation table up to close the firing chamber.

3.   Turn the device off, and fold the power cable from the plug.

Storage conditions
The firing furnace may only be stored in the original packaging. Observe the packaging symbols (see Fig. 4- 1), and maintain the storage conditions that are specified in section1.6.

7.2.   Disposal

7.2.1.   Personnel qualifications

The operator can recycle or dispose of the system in accordance with legal provisions. A good knowledge of mechanics and how to differentiate between waste materials is required to properly disassemble the system and separate the materials.

7.2.2.   Legal guidelines

Responsibilities
The operator is responsible for proper disposal of the AUSTROMAT® µSiC®. The operator can give the firing furnace to a licensed private or public collection facility, or the operator can recycle or dispose of the firing furnace himself.

NOTE:
If the operator gives the AUSTROMAT® µSiC® to a recycling facility, he must also provide the instructions for use. The instructions for use contain all the important instructions for disposal of the firing furnace.

Reporting requirement
Companies that dispose of or recycle their own waste are subject to official approval and inspection. Under certain circumstances, they can be freed from the approval requirement if they take the requirements of environment protection into account. These companies are subjected to a reporting requirement. You can find out more information at the responsible office for environmental protection.

Environmental protection requirements
Wastes must be recycled or disposed of in such a manner that it does not pose a hazard to human health. Only those procedures or methods may be used that do not harm the environment. In particular, care must be taken that:

- The air, water and earth are not contaminated,

- Animals and vegetable life are not endangered,

- No excessive noise or odor arises,

- The surroundings and the landscape are not impaired.

Sorting
After the firing furnace has been disassembled, the individual parts must be sorted into waste groups. This is done according to the list in the current European Waste Catalog (EWC) or comparable documents. The EWC catalog applies for waste independent of whether it is disposed or recycled.

7.2.3.   Disposal: Electrical and electronic materials

WEEE
The European Commission has issued a directive on the disposal of electrical and electronic materials (WEEE; 2002/96/EC). According to this directive, manufacturers have been responsible since August 2005 for returning and recycling electronic and electrical devices if no exception has been granted. As a manufacturer of laboratory equipment, DEKEMA Dental-Keramiköfen GmbH Is freed from this requirement. Dental ceramic furnaces do not have to be returned to DEKEMA Dental-Keramiköfen GmbH.

	⚠ **CAUTION**
	Electrical and electronic materials **Electrical and electronic materials can negatively influence the environment.** **Do not treat electrical and electronic trails as unsorted garbage. Collect old electrical and electronic devices separately.**

7.2.4.   Disposal: Other assemblies and components

The components of the AUSTROMAT® µSiC® are composed of the following materials:

- Metals and alloys
    - Aluminum (housing, cover panels, etc.)
    - Copper (cooling plates, electrical lines)
    - Steel (sections, fastening materials such as screws, etc.)
    - High-grade steel

- Glass and ceramic materials
    - Glass (screens and displays)
    - Ceramic insulation material (insulation table, firing chamber)

- Plastics and rubber
    - Plastics (hoses, covers, wheels, etc.)
    - Rubber (seals, silicone hoses)

- Composites
    - Electrical materials (cables, motors, components)
    - Electronic materials (printed circuit boards, computer, predator)

- Packaging
    - Styrofoam (cushion material)
    - Plastic (films)

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