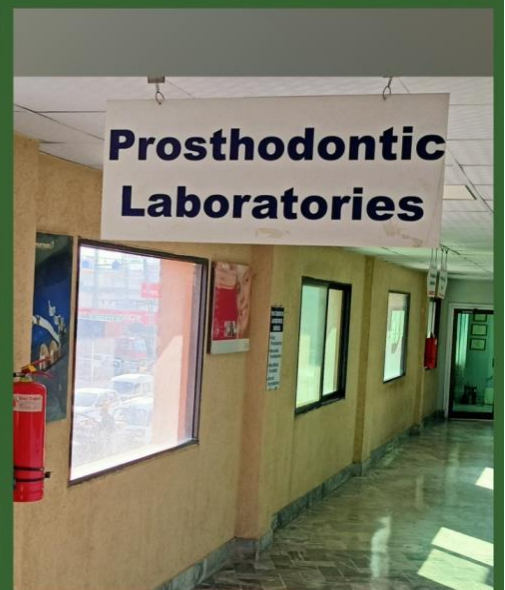




DEPARTMENT OF PROSTHODONTICS LABORATORIES MANUAL





PREPARED AND COMPILED BY:

PROF. DR. MAJID ZIA

HEAD DEPARTMENT OF PROSTHODONTICS

WOMEN DENTAL COLLEGE, ABBOTTABAD

**CONSULTANT PROSTHODONTIST AND
IMPLANTOLOGIST**

REHMAT MEMORIAL HOSPITAL, ABBOTTABAD

Table of Contents

INTRODUCTION	6
AIMS AND OBJECTIVES:	6
FACULTY RESPONSIBLE FOR COURSE CONDUCTION:	7
LABORATORY STAFF.....	7
CURRICULUM MAP FOR UNDERGRADUATE STUDENTS IN LABORATORY TECHNOLOGY:.....	7
LABORATORY TUTORIALS IN GENERAL FOR UNDERGRADUATE AND POSTGRADUATE RESIDENTS OF REHMAT MEMORIAL HOSPITAL:	11
2. MATERIAL HANDLING AND PREPARATION.....	11
3. PREPARING IMPRESSIONS.....	12
4. FABRICATION OF CROWNS	12
5. CREATING BRIDGES.....	12
6. DENTURE FABRICATION	12
7. IMPLANT PROSTHETICS.....	13
8. MAXILLOFACIAL PROSTHETICS.....	13
9. QUALITY CONTROL AND TROUBLESHOOTING.....	13
10. PATIENT COMMUNICATION AND CARE.....	13
SAFETY GUIDELINES FOR THE PROSTHODONTICS LABORATORIES.....	14
LIST OF EQUIPMENT AND MATERIALS FOR A PROSTHODONTICS LAB	15
CATEGORIES OF PROSTHODONTICS LABORATORIES.....	17
PROSTHODONTIC LABORATORY GLIMPSE.....	19
I. MODULE INFORMATION.....	68
II. SETTING UP OF THE ARTICULATED TEETH	68
III. PREPARING TOOTH FOR FULL CROWN RESTORATION	70
A. OCCLUSAL SURFACE REDUCTION	71
B. BUCCAL AND LINGUAL SURFACES REDUCTIONS.....	72
C. PROXIMAL SURFACE REDUCTION.....	75

D. FUNCTIONAL CUSP BEVEL	76
E. MARGIN PREPARATION.....	77
F. FINISHING THE PREPARATION.....	78

GENERAL FEATURES OF FULL GOLD CROWN (FGC) PREPARATION FOR POSTERIOR TEETH.....79

IV. EVALUATING THE PREPARATION.....	80
PORCELAIN FUSED TO METAL (PFM) / 12	81

GENERAL FEATURES OF PORCELAIN FUSED TO METAL (PFM) CROWN PREPARATION FOR POSTERIOR TEETH.....82

ALL CERAMIC CROWN / 8.....	83
----------------------------	----

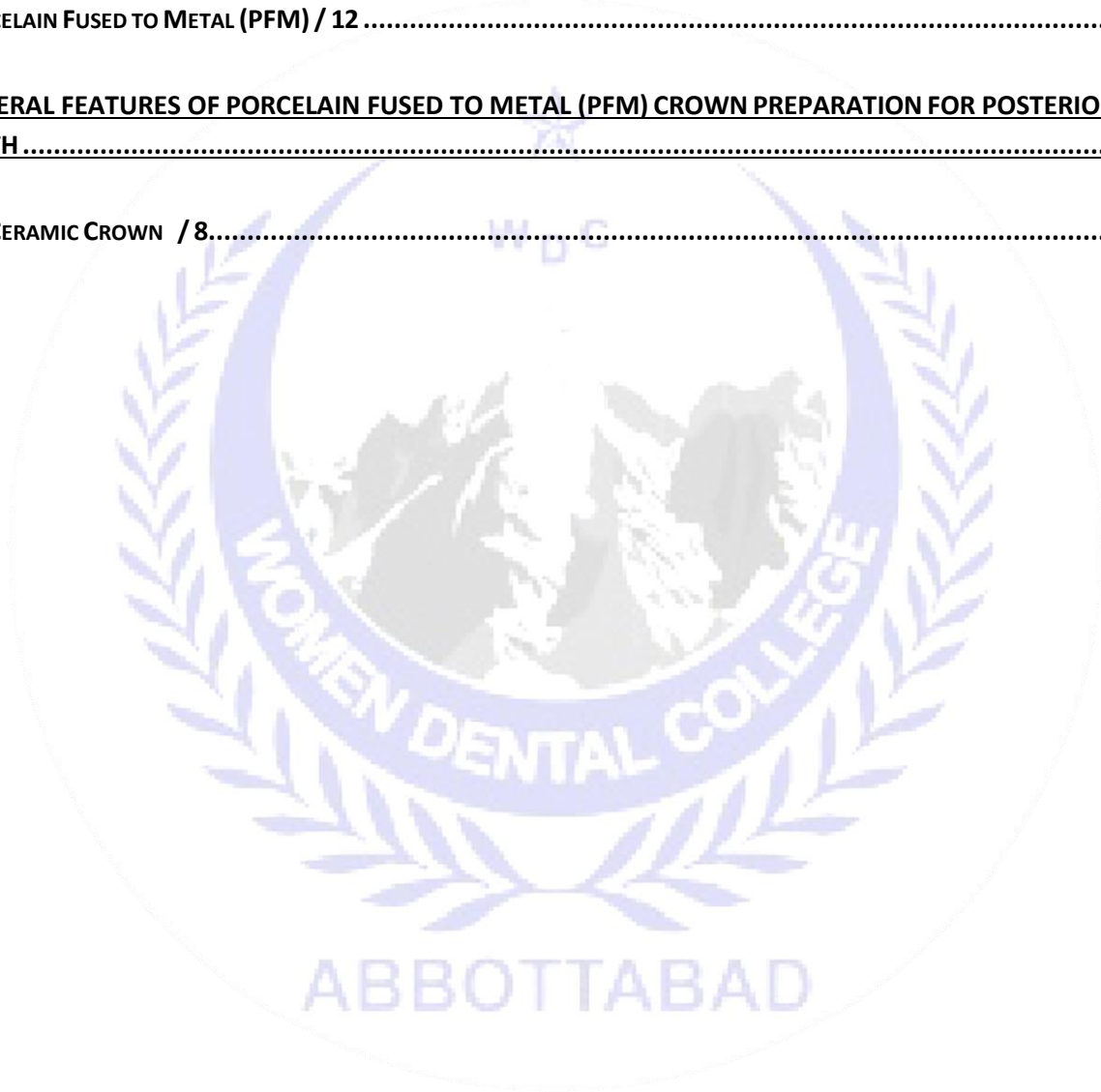


TABLE OF FIGURES

Figure 1 ELECTRICAL INDUCTION CASTING UNIT (FORNAX T FROM BEGO).....	21
Figure 2 COMBINATION BLASTER	23
Figure 3 ELTROPOL 300.....	26
Figure 4 MOTOVA 100 VACCUM MIXER	31
Figure 5 PROGRAMAT EP 3000 (PRESS FURNACE).....	37
Figure 6 MIDITHERM 100 MP (PREHEAT FURNACE).....	41
Figure 7 ULTRASONIC BATH	44
Figure 8 VACCUM PUMP FOR PRESS FURNACE	51
Figure 9 WHIP MIX 3000 SERIES ARTICULATORS.....	53
Figure 10 HANGING ENGINE	55
Figure 11 MODEL TRIMMER	56
Figure 12 VIBRATOR.....	56
Figure 13 HIGH TORQUE MICRO MOTOR	57
Figure 14 MILLING UNIT.....	59
Figure 15 DENTAL SURVEYOR WITH MILLING MACHINE.....	63
Figure 16 VACCUM FORMING MACHINE	64
Figure 17 POLYMERIZING MACHINE.....	66

Introduction

Prosthodontics is the dental specialty focused on designing and fitting artificial replacements for missing or damaged teeth and oral structures. This manual provides essential guidance for students and technicians in prosthodontic labs, outlining procedures for creating functional and aesthetically viable removable and fixed dental prostheses.

The manual briefly enlists the different processes, from material selection to the overview for fabrication of different prostheses. It emphasizes precision and best practices to ensure high-quality results. By following these guidelines, the individuals can effectively restore dental function and aesthetics, contributing to improved and predictable patient outcomes.

Aims and Objectives:

Aims:

1. **Enhance Practical Skills:** Develop hands-on expertise in the design, creation, and fitting of prosthetic devices, including crowns, bridges, and dentures.
2. **Ensure Precision:** Achieve high levels of accuracy in fabricating prosthetics to ensure proper fit, function, and aesthetic appeal.
3. **Understand Materials:** Gain a thorough understanding of the properties and applications of various materials used in prosthodontics to select the most suitable options for each case.
4. **Promote Patient Care:** Equip students and technicians with the skills to produce prosthetics that improve patient comfort, function, and appearance, thereby contributing to overall oral health and quality of life.

Objectives:

1. **Master Fabrication Techniques:** Learn and apply step-by-step procedures for the accurate fabrication of crowns, bridges, and dentures.
2. **Analyze and Troubleshoot:** Identify common issues in prosthetic design and fabrication, and apply troubleshooting techniques to resolve them effectively.
3. **Adhere to Standards:** Follow established protocols and best practices to ensure the quality and consistency of prosthetic devices.
4. **Integrate Theory and Practice:** Bridge the gap between theoretical knowledge and practical application in prosthodontics, enhancing overall competency in the field.

Faculty Responsible for Course Conduction:

Serial. No	Faculty	Department	Designation
01	Prof. Dr. Majid Zia	Prosthodontics	HOD/Professor
02	Prof. Dr. Hassan Naveed	Prosthodontics	Professor

Laboratory Staff

Serial. No	Name	Laboratory	Designation
01	M. Riasat	Acrylic Lab	In charge
02	M. Usman	Acrylic Lab	Lab Technologist
03	Dawood	Acrylic Lab	Lab Technologist
04	Siraj	Acrylic Lab	Assistant
05	Adil Ali	Ceramic & Casting Lab	In charge Ceramist
06	Zafar Hussain	Ceramic & Casting Lab	Assistant Ceramist
07	Abdul Saboor Khan	Ceramic & Casting Lab	Assistant

Curriculum Map for Undergraduate Students in Laboratory Technology:

S.No	Class	Topic	Learning Outcomes	Mode of Teaching	Assessment Tools
1	2 nd Year BDS	Removable Prosthodontics	<ul style="list-style-type: none"> Demonstrate fabrication of a custom tray on a completely edentulous casts using cold cured acrylic resin. 	Demonstration	Formative Assessment
2			<ul style="list-style-type: none"> Demonstrate pouring of completely edentulous casts Demonstrate creation of stable base for the cast 	Demonstration	Formative Assessment
3			<ul style="list-style-type: none"> Demonstrate fabrication of a denture base using cold cure acrylic resin on completely edentulous cast 	Demonstration/SGD	Formative Assessment

4	2 nd Year BDS	<ul style="list-style-type: none"> • Demonstrate Fabrication of maxillary and mandibular occlusion rims according to the recommended dimensions for partially dentate and completely edentulous cast • Demonstrate inscribing the Important guiding lines in association with the anatomic landmarks. 	Demonstration	Formative Assessment
1		<ul style="list-style-type: none"> • Demonstrate articulation of the fabricated rims in Class I Maxillomandibular relationship on a semi-adjustable articulator. 	Demonstration	Formative assessment
2		<ul style="list-style-type: none"> • Demonstrate complete denture teeth arrangement. • Demonstrate Waxing, pooling, carving & festooning 	Demonstration	Formative assessment
3		<ul style="list-style-type: none"> • Demonstrate investment of denture bases using dental plaster • Demonstrate dewaxing of the invested denture base • Demonstrate manipulation of heat-cured acrylic resin • Demonstrate trial packing of resin into the mold • Demonstrate final packing of acrylic resin in the mold • Demonstrate curing of acrylic resin • Demonstrate divesting of the cured dentures • Demonstrate finishing and polishing of cured dentures 	Demonstration and SGD	Formative assessment
4		<ul style="list-style-type: none"> • Demonstrate pouring of the partially dentate casts and making base of the cast • Demonstrate fabrication of C-clasp and looped clasps for the edentulous span using 0.7 mm stainless steel wire 	Demonstration	Formative assessment

5			<ul style="list-style-type: none"> • Demonstrate wax up for acrylic partial denture using modeling wax 	Demonstration	Formative assessment
6	3 rd year BDS	Removable partial dental prosthesis	<ul style="list-style-type: none"> • Identify the armamentarium used in removable partial denture Prosthodontics • Demonstrate pouring of the patients partially dentate casts • Prepare the base of the cast • Demonstrate trimming of the cast base • Identify the anatomical landmark on the cast • Identify the supporting and limiting structure of denture base • Identify the soft tissue and hard tissue undercuts • Demonstrate blocking of the undesirable undercuts • Demonstrate articulation of the cast • Design the partial denture base • Design and construct the direct retainers • Demonstrate wax up of the denture base • Demonstrate Teeth/Tooth arrangement • Demonstrate investing and flasking • Demonstrate dewaxing of partial denture • Demonstrate packing/curing of partial denture • Demonstrate finishing of the RPD 	SGD and Demonstration	OSCE and Formative assessment
			<ul style="list-style-type: none"> • Discuss, demonstrate and explain the laboratory steps involved in the fabrication of Removable cast dental Prosthesis 	Demonstration and SGD	OSCE and Formative assessment

7	Final Year BDS	Removable Prosthodontics (Complete Denture)	<ul style="list-style-type: none"> • Demonstrate pouring of the impression in soft plaster to create dental cast for completely edentulous patient • Prepare base of the cast • Demonstrate fabrication of special/custom trays • Demonstrate pouring of the impression in hard plaster to create master cast • Demonstrate creation of base of the cast • Demonstrate fabrication of denture base • Demonstrate fabrication of the occlusion rims • Demonstrate articulating the cast on a semi adjustable articulator • Demonstrate and explain arrangement of Teeth • Demonstrate pooling, carving and festooning • Demonstrate Investment (2 pour and 3 pour techniques in Flasking) • Demonstrate de-waxing procedure • Demonstrate Packing with heat cure acrylic resin, Curing, finishing and polishing of the denture 	Demonstration and SGD	OSCE and Formative assessment
8	Final Year BDS	Fixed Prosthodontics	<ul style="list-style-type: none"> • Discuss and demonstrate the creation of dies and casts • Discuss and demonstrate the laboratory steps in wax-up of conventional and contemporary crown and bridges (Fixed Dental Prostheses) • Discuss and demonstrate the casting procedure in 	Demonstration and SGD	OSCE and Formative assessment
				Demonstration and SGD	Formative assessment
				Demonstration and SGD	Formative assessment

			conventional Fixed Prosthodontics		
			<ul style="list-style-type: none"> Demonstrate and explain the use of ceramics in conventional and contemporary Fixed prosthodontics 	Demonstration and SGD	Formative assessment
			<ul style="list-style-type: none"> Demonstrate preparation of teeth on typodonts/Phantom Heads for Cast Metal Crowns Metal Ceramic Crowns All Ceramic Crowns (According to the provided Full crown Module) 	Demonstration and SGD	OSCE and Formative assessment

Laboratory Tutorials in General for Undergraduate and Postgraduate Residents of Rehmat Memorial Hospital:

1. Introduction

- **Overview:** This introductory session familiarizes students with the lab environment and protocols.
- **Objectives:**
 - Understand lab safety procedures and emergency protocols.
 - Identify and learn the use of essential lab equipment and materials.
- **Content:**
 - **Lab Safety Guidelines:** Proper attire (lab coats, gloves, safety glasses), emergency exits, and first aid.
 - **Equipment Overview:** Introduction to lathes, handpieces, casting machines, digital scanners, etc.
 - **Material Handling:** Overview of common materials (ceramics, resins, alloys) and their storage requirements.
 - **Basic Procedures:** Cleanliness, organization, and handling of tools and materials.

2. Material Handling and Preparation

- **Overview:** Learn how to handle and prepare dental materials for use in prosthetic fabrication.

- **Objectives:**
 - Gain proficiency in mixing, handling, and storing various materials.
- **Content:**
 - **Types of Materials:**
 - **Ceramics:** Porcelain, zirconia (for crowns and veneers).
 - **Resins:** Acrylics (for dentures and temporary restorations).
 - **Alloys:** Noble and base metal alloys (for metal frameworks).
 - **Mixing Techniques:** Use of vacuum mixers and manual mixing methods.
 - **Handling:** Avoid contamination, use appropriate mixing tools.
 - **Storage and Disposal:** Proper storage conditions and waste disposal methods.

3. Preparing Impressions

- **Overview:** Techniques for obtaining accurate prosthetic models.
- **Objectives:**
 - Master the process of model preparation.
- **Content:**
 - **Model Preparation:** Pouring plaster or stone, trimming models.

4. Fabrication of Crowns

- **Overview:** Steps involved in creating dental crowns.
- **Objectives:**
 - Learn the full process from tooth preparation to final fitting.
- **Content:**
 - **Tooth Preparation:** Shaping the tooth to accommodate the crown.
 - **Impression Taking:** Capturing the prepared tooth and surrounding structures.
 - **Wax-Up:** Creating a wax model of the crown.
 - **Casting or Milling:** Using metal or ceramic materials to create the crown.
 - **Finishing and Adjustments:** Polishing and fitting the crown.

5. Creating Bridges

- **Overview:** Process of designing and fabricating dental bridges.
- **Objectives:**
 - Understand the fabrication of fixed bridges for replacing multiple missing teeth.
- **Content:**
 - **Tooth Preparation:** Preparing abutment teeth for bridge placement.
 - **Impression and Framework Design:** Capturing impressions and creating the bridge framework.
 - **Try-In:** Testing the bridge for fit and function.
 - **Cementation:** Final placement and adjustment of the bridge.

6. Denture Fabrication

- **Overview:** Creating complete and partial dentures.

- **Objectives:**
 - Develop skills in constructing removable prostheses.
- **Content:**
 - **Impression Techniques:** Taking accurate impressions for dentures.
 - **Denture Base Creation:** Making the denture base using acrylic resins.
 - **Teeth Setup:** Positioning artificial teeth and adjusting occlusion.
 - **Processing and Finishing:** Curing the denture and final adjustments.

7. Implant Prosthetics

- **Overview:** Designing and fabricating prosthetics for dental implants.
- **Objectives:**
 - Learn the process for creating implant-supported restorations.
- **Content:**
 - **Implant Impression Techniques:** Capturing the position of dental implants.
 - **Custom Abutment Design:** Creating custom components that fit the implants.
 - **Prosthetic Fabrication:** Designing and fabricating implant-supported crowns and bridges.
 - **Final Fitting:** Ensuring proper fit and function.

8. Maxillofacial Prosthetics

- **Overview:** Fabrication of prosthetics for Maxillofacial Defects
- **Objectives:**
 - Develop skills for creating Maxillary and Mandibular resection prostheses.
- **Content:**
 - **Design Considerations:** Customizing prosthetics to match patient anatomy.
 - **Material Selection:** Using biocompatible materials.
 - **Fabrication Techniques:** Techniques for creating functional and aesthetically pleasing prostheses.
 - **Fitting and Adjustment:** Ensuring comfort and natural appearance.

9. Quality Control and Troubleshooting

- **Overview:** Techniques for ensuring the accuracy and quality of prosthetics.
- **Objectives:**
 - Identify and resolve common issues in prosthetic fabrication.
- **Content:**
 - **Fit and Function Checks:** Assessing and adjusting prosthetics for proper fit.
 - **Common Problems:** Identifying issues such as misfit or occlusal discrepancies.
 - **Troubleshooting Techniques:** Practical solutions for common fabrication problems.
 - **Refinement Techniques:** Adjustments and refinements for optimal results.

10. Patient Communication and Care

- **Overview:** Best practices for interacting with patients regarding prosthetics.

- **Objectives:**
 - Improve communication skills and patient management.
- **Content:**
 - **Patient Consultation:** Discussing prosthetic options and expectations.
 - **Handling Feedback:** Addressing patient concerns and making adjustments.
 - **Post-Procedure Care:** Providing instructions for maintenance and care of prosthetics.

These detailed tutorials provide a comprehensive guide for mastering the skills required in a prosthodontics lab, ensuring proficiency in both traditional and modern techniques for creating high-quality dental prosthetics.

Safety Guidelines for the Prosthodontics Laboratories

1. **Personal Protective Equipment (PPE):**
 - **Wear Lab Coats:** Always wear a lab coat to protect your clothing and skin from chemicals and debris.
 - **Use Safety Glasses:** Protect your eyes from dust, particles, and splashes.
 - **Gloves:** Use gloves to handle materials and avoid direct skin contact with chemicals and potentially hazardous substances.
 - **Masks:** Wear masks to prevent inhalation of dust and fumes, especially when working with materials that generate fine particles or volatile substances.
2. **Chemical Safety:**
 - **Proper Storage:** Store chemicals and dental materials according to manufacturer instructions, in well-ventilated areas, and away from heat sources.
 - **Handle with Care:** Read and follow the Safety Data Sheets (SDS) for all materials used. Avoid direct skin and eye contact with chemicals.
 - **Dispose of Waste Properly:** Follow lab protocols for the disposal of chemical waste and other hazardous materials. Use designated containers for different types of waste.
3. **Equipment Safety:**
 - **Inspect Regularly:** Regularly check equipment for damage or wear and ensure it is functioning correctly before use.
 - **Use as Intended:** Operate equipment according to manufacturer guidelines and training. Avoid improvising or using equipment for unintended purposes.
 - **Maintain Cleanliness:** Keep work surfaces and equipment clean and organized to prevent accidents and contamination.
4. **Fire and Emergency Procedures:**
 - **Know Emergency Exits:** Familiarize yourself with the lab's layout, including the locations of emergency exits and fire extinguishers.
 - **Report Hazards:** Immediately report any spills, leaks, or safety hazards to the lab supervisor.
 - **Follow Protocols:** Adhere to established fire and emergency protocols, including evacuation procedures and the use of safety equipment.

5. Ergonomics and Physical Safety:

- **Proper Posture:** Maintain correct posture and use ergonomic equipment to prevent strain and injury during prolonged lab work.
- **Lift Safely:** Use correct lifting techniques to avoid back injury when handling heavy materials or equipment.
- **Stay Alert:** Avoid distractions and stay focused while working to reduce the risk of accidents and mistakes.

6. Hygiene and Cleanliness:

- **Hand Washing:** Wash hands thoroughly after handling materials, chemicals, or equipment, and before eating or touching your face.
- **Clean Work Areas:** Regularly clean and disinfect work surfaces and tools to maintain a sanitary lab environment.
- **Avoid Eating or Drinking:** Do not eat or drink in the lab to prevent contamination and exposure to hazardous substances.

7. Training and Compliance:

- **Complete Training:** Ensure that you have received proper training in lab safety procedures and the use of equipment before working in the lab.
- **Follow Guidelines:** Adhere strictly to all safety guidelines and protocols established by the lab and regulatory bodies.

By following these safety guidelines, you can help maintain a safe and efficient working environment in the prosthodontics lab, ensuring both personal well-being and the integrity of your work.

List of Equipment and Materials for a Prosthodontics Lab

1. Equipment:

- **Dental Lathes:**
 - **Purpose:** For polishing and finishing dental prosthetics.
 - **Details:** Includes various attachments such as buffing wheels and brushes.
- **Dental Handpieces:**
 - **Purpose:** To cut, shape, and finish dental materials.
 - **Details:** High-speed and low-speed handpieces with various burs and tips.
- **Dental Presses:**
 - **Purpose:** For pressing ceramics or other materials into molds.
 - **Details:** Hydraulic or mechanical presses designed for specific materials.
- **Casting Machines:**
 - **Purpose:** For melting and casting metal alloys into prosthetic frameworks.
 - **Details:** Includes centrifugal or vacuum casting machines.
- **Dental Oven/Furnace:**
 - **Purpose:** To heat materials for curing or sintering.

- **Details:** Must reach specific temperatures for different materials, such as ceramics and metal alloys.
- **Trimming Units:**
 - **Purpose:** For trimming and adjusting prosthetic materials.
 - **Details:** Includes equipment for precision cutting and grinding.
- **Vacuum Mixer:**
 - **Purpose:** To mix dental materials like gypsum or resins without air bubbles.
 - **Details:** Features a vacuum system to ensure thorough mixing.
- **Articulators:**
 - **Purpose:** To simulate the jaw movements and occlusion for accurate prosthetic fitting.
 - **Details:** Adjustable models to replicate various bite conditions.
- **Micromotor Units:**
 - **Purpose:** For precise adjustment and finishing of prosthetic components.
 - **Details:** Includes handpieces with adjustable speed and torque.

2. Materials:

- **Dental Ceramics:**
 - **Purpose:** For fabricating crowns, bridges, and veneers.
 - **Details:** Includes materials like porcelain, zirconia, and lithium disilicate.
- **Dental Alloys:**
 - **Purpose:** For making metal frameworks for cast fixed and removable dental prostheses.
 - **Details:** Includes noble, base metal, and high noble alloys.
- **Acrylic Resins:**
 - **Purpose:** For constructing dentures and temporary prosthetics.
 - **Details:** Includes heat-cured and cold-cured resins.
- **Impression Materials:**
 - **Purpose:** To create accurate duplication of casts and dies.
 - **Details:** Includes alginate, polyvinyl siloxane (PVS), Agar, and polysulfide materials.
- **Gypsum Products:**
 - **Purpose:** For creating dental models and casts.
 - **Details:** Includes dental plaster, stone, and high-strength stone.
- **Adhesives and Cements:**
 - **Purpose:** For bonding prosthetic components to natural teeth or implants.
 - **Details:** Includes resin cements, glass ionomer cements, and temporary adhesives.
- **Polishing Materials:**
 - **Purpose:** For finishing and polishing prosthetics.
 - **Details:** Includes polishing powders, brushes, and abrasive discs.
- **Denture Base Materials:**
 - **Purpose:** For constructing the base of removable dentures.

- **Details:** Includes acrylic resins and thermoplastic materials.
- **Relining Materials:**
 - **Purpose:** To adjust the fit of existing dentures.
 - **Details:** Includes soft and hard relining materials.
- **Waxes:**
 - **Purpose:** For making patterns and adjusting prosthetic designs.
 - **Details:** Includes pattern waxes, baseplate waxes, and utility waxes.
- **Models and Dies:**
 - **Purpose:** For creating accurate representations of teeth and oral structures.
 - **Details:** Includes dental stone models and working dies.
- **Plaster Spatulas and Mixing Bowls:**
 - **Purpose:** For mixing and handling plaster and other materials.
 - **Details:** Includes stainless steel or plastic spatulas and mixing bowls.

This comprehensive list ensures that a prosthodontics lab is well-equipped to handle the various tasks involved in fabricating high-quality prosthetic devices, supporting both precision and efficiency in dental care.

Categories of Prosthodontics Laboratories

1. **General Prosthodontics Laboratory:**
 - **Purpose:** Focuses on the fabrication of standard prostheses like removable partial and complete dental prostheses in PMMA materials.
 - **Services:** Includes routine tasks like pouring of impressions, fabrication of models, and the production of various acrylic material prostheses.
 - **Features:** Equipped with basic dental lab tools, materials, and equipment for general prosthetic work.
2. **Implant Prosthodontics Laboratory: Part of Ceramic and Casting lab at RMH**
 - **Purpose:** Specializes in the design and fabrication of prosthetics that are supported by dental implants.
 - **Services:** Includes creating implant-supported crowns, bridges, overdentures, and custom abutments.
 - **Features:** Advanced tools for precision work, including implant planning software and specialized implant components.

Ceramic and casting Laboratory

3. **Ceramic Prosthodontics Laboratory:**
 - **Purpose:** Dedicated to the creation of ceramic-based prosthetics for aesthetic and functional purposes.
 - **Services:** Produces Cast metal crowns, PFM crowns, veneers, inlays, onlays, and all ceramic restorations.

- **Features:** High-temperature furnaces, ceramic mills, and various types of ceramic materials.
- 4. **Removable Prosthodontics:**
 - **Purpose:** Focuses on the fabrication of removable dental prostheses such as complete dentures, partial dentures.
 - **Services:** Includes the design, adjustment, and fitting of removable prosthetics to ensure comfort and functionality.
 - **Features:** Includes equipment for acrylic processing, denture base material handling, and reline materials.
- 5. **Fixed Prosthodontics:**
 - **Purpose:** Specializes in fixed prosthetics that are permanently affixed to teeth or implants.
 - **Services:** Produces crowns, bridges, and other fixed restorations with a focus on durability and precision.
 - **Features:** High-precision equipment for metal and ceramic restorations, including casting machines and milling units.

Each category of prosthodontics laboratory serves a specific function within the field, allowing for specialization and expertise in various aspects of prosthetic design and fabrication. By understanding these categories, dental professionals can better address the diverse needs of their patients and contribute to advancements in prosthodontic care.



PROSTHODONTIC LABORATORY GLIMPSE



The logo of Women Dental College, Abbottabad is a circular emblem. At the top center is a five-pointed star. Below the star are the letters 'WDC'. The central part of the emblem features a map of Pakistan, with a dental chair and a dental professional positioned over it. This central scene is framed by a crescent moon and a banner that reads 'WOMEN DENTAL COLLEGE'. The entire emblem is surrounded by a laurel wreath. At the bottom of the emblem, the word 'ABBOTTABAD' is written in capital letters.

**SELECTED EQUIPMENT WITH THEIR
MANUALS**

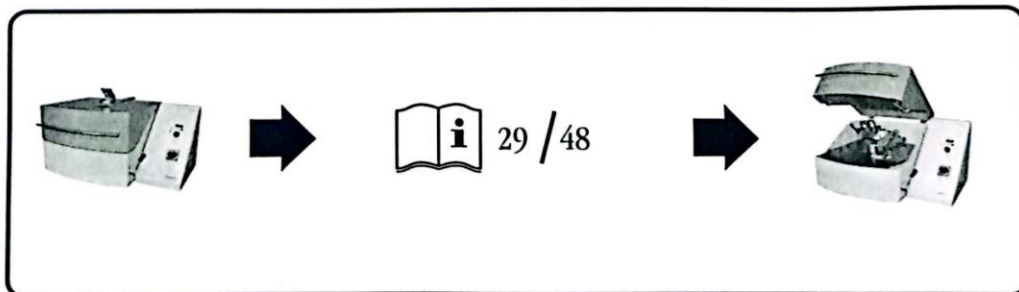
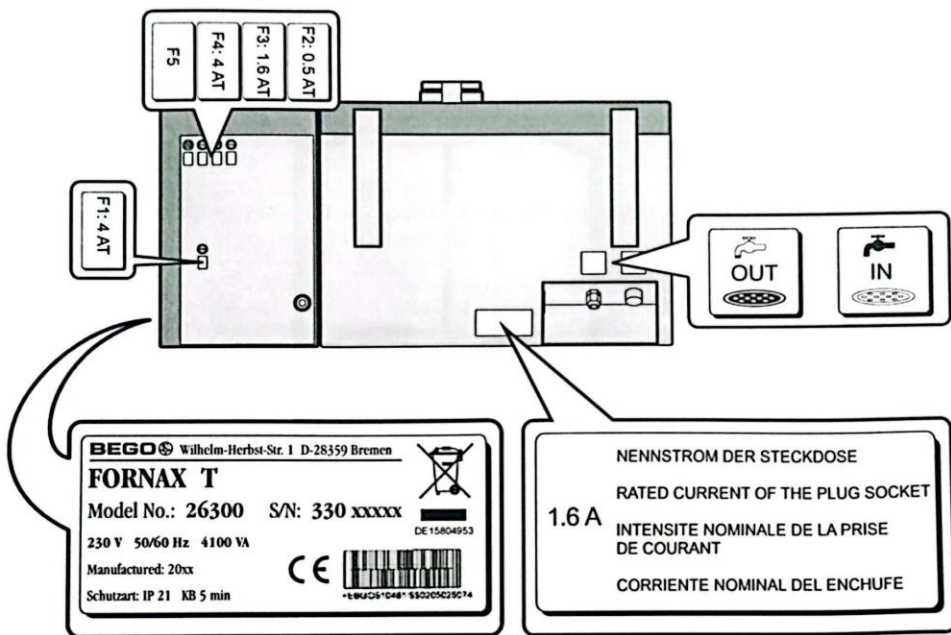
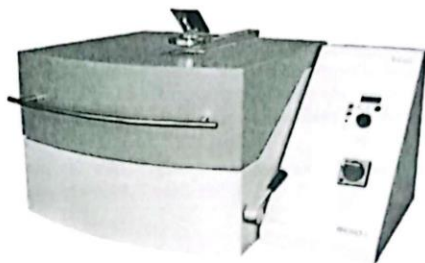


Figure 1 ELECTRICAL INDUCTION CASTING UNIT (FORNAX T FROM BEGO)

Safety instructions

The HF Fornax T centrifugal casting machine is designed exclusively for casting dental alloys, with the exception of titanium. Any other use is considered to be improper. We shall not be liable for any damage resulting from improper use.

CAUTION! Titanium reacts very strongly to the crucibles – personal injury and damage to the unit are possible!

During melting, alloys containing beryllium produce strong oxides that cause considerable wear to the crucibles and remain there in significant quantities. **CAUTION!** When beryllium is processed, carcinogenic particles are released. Wear mouth protection and ensure good suction extraction when casting and finishing!

The safety instructions must be followed in order to avoid personal injury or damage to equipment. We shall not be liable for failure to comply with the safety instructions.

General safety instructions

- The unit may only be operated by staff who are familiar and comply with the content of these operating instructions. ● The operating instructions must be accessible during operation of the unit. ● In addition to these operating instructions, the national accident prevention regulations must be observed.
- Prior to making the electrical connection, check whether the specifications on the rating plate conform with those of the supply network. In the event of uncertainty, consult a specialised staff member. ● The unit is subject to class of protection I and may only be connected to properly earthed power sources. ● No modifications may be made to the unit. ● Maintain signs and stickers in good legible condition. They must not be removed. ● Check the unit and the leads regularly for damage. The unit must not be operated if it has defects that may endanger employees or third parties. ● Protect the leads against heat, oil and sharp edges. The leads must not be used to carry the unit or to pull out the plug.
- Switch off the unit and pull out the plug prior to any care, cleaning or maintenance. ● Use only dry or slightly moist cloths for cleaning purposes. Do not splash the unit with water or immerse it in water. ● Always have repairs, especially of electrical parts, carried out by specialised staff or customer service personnel.

Special safety instructions regarding this unit

Hazards due to electromagnetic radiation



- Persons with electronic implants (for instance, pacemakers) may not remain in the same room in which the ready-to-operate machine is located.
- The warning signs provided (symbol: "pacemaker") are to be placed at the entrances to the room in which the ready-to-operate machine is located.

Danger of burns due to hot parts!

- Wear protective clothing (protective apron), safety shoes, safety goggles and protective gloves.
- Always use mould tongs to move moulds and hot crucibles.
- Touch hot crucible inserts and hot cast metal parts only with forceps.
- **Place hot parts only on a fireproof surface.**
- Carry out maintenance and cleaning work prior to casting or once the unit has cooled down.



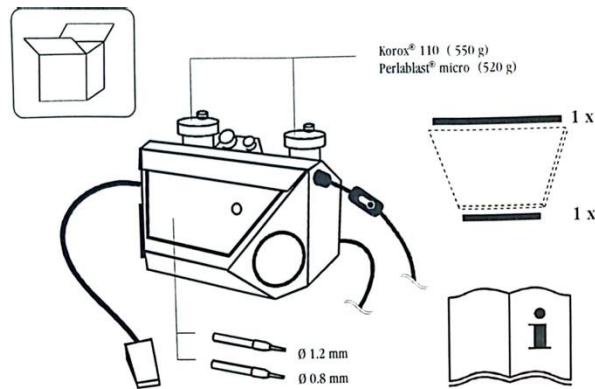
This symbol marks very important information. Failure to comply with it may result in personal injury.



This symbol marks important information. Failure to comply with it may result in damage to the unit or the work result may be unsuccessful.



This symbol warns about hot parts.



12,3 kg + 550 g Korox® 110 + 520 g Perlablast® micro = 14,0 kg

230 / 240 V, 50 Hz, 8 W → Ref. No. 26080
110 V, 50 / 60 Hz, 8 W → Ref. No. 26081

3 6 bar (0.3 0.6 MPa), 1/4", ~ 60 ltr. / min.

~ 700 g

Figure 2 COMBINATION BLASTER



SAFETY INSTRUCTIONS

Easyblast is designed exclusively for cleaning, roughening and blast-polishing in dental technology applications. Any other use is considered to be improper. We shall not be liable for any damage resulting from improper use.

The safety instructions must be followed in order to avoid personal injury or damage to equipment. We shall not be liable for failure to comply with the safety instructions.

- The unit may only be operated by staff who are familiar and comply with the content of these operating instructions. • The operating instructions must be accessible during operation of the unit. • In addition to these operating instructions, the national accident prevention regulations must be observed.
- Prior to making the electrical connection, check whether the specifications on the rating plate conform with those of the supply network. In the event of uncertainty, consult a specialised staff member. • No modifications may be made to the unit. • Maintain signs and stickers in good legible condition. They must not be removed. • Check the unit and the leads regularly for damage. The unit must not be operated if it has defects that may endanger employees or third parties. • Protect the leads against heat, oil and sharp edges. The leads must not be used to carry the unit or to pull out the plug.
- Switch off the unit and pull out the plug prior to any care, cleaning or maintenance. • Use only dry or slightly moist cloths for cleaning purposes. Do not splash the unit with water or immerse it in water. • Always have repairs, especially of electrical parts, carried out by specialised staff or customer service personnel.

Caution: Risk of injury!

- Only blast when window is closed! Otherwise there is a risk of injury caused by blasting material.
- Blast only while suction extraction system is running! Otherwise there is a risk of harmful effects from dust.
- Keep blasting material chamber and venting screws securely closed during operation! Otherwise there is a risk of injury caused by blasting material.
- Never look into a (clogged) nozzle when the unit is ready for operation! Otherwise there is a risk of injury due to unintentionally triggered blasting.

• Switch off the unit before opening the window (set lever to 0)!
Switch off the unit before opening the blasting material chamber (set lever to 0) and loosen the venting screws on the covers.



Ersatzteil-Stückliste

EasyBlast

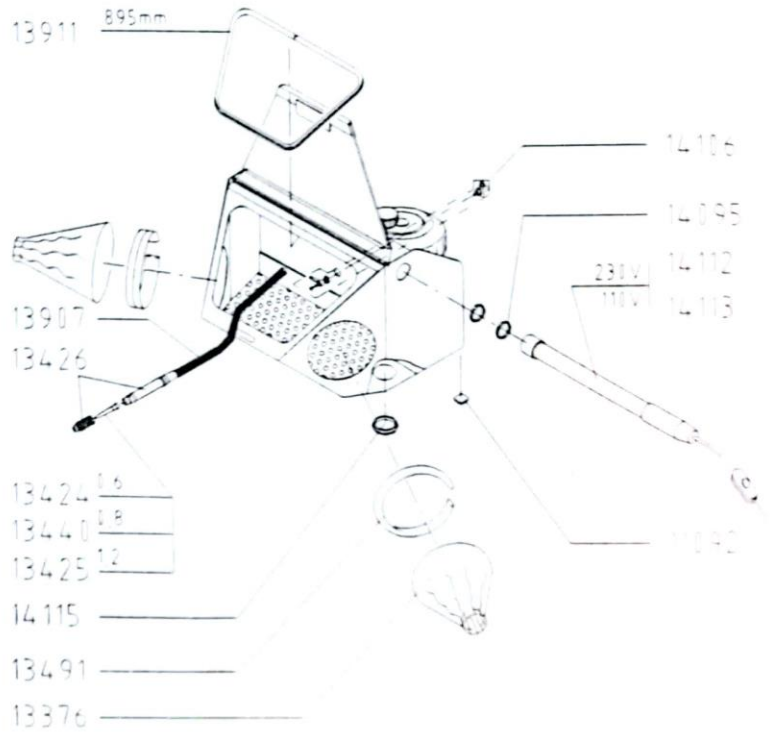
BEGO 

Spare Part List - Liste de pièces de rechange
Relación de piezas de recambio

Dok.-Nr 85767/00
gültig ab Geräte-Nr./valid from serial No./
valable à partir du No de série/válido desde la serie No
298.00001

Miteinander zum Erfolg

Fig. 1



Bestell-Nr. Order No.	Ersatzteil-Bezeichnung	Spare part	Für Netzspannung For tension
11092	1 Gehäusefuß	1 housing base	alle / all
13376	2 Manschetten	2 sleeves	alle / all
13424	5 Feinstrahldüsen Ø 0,6	5 fine blasting jets Ø 0.6	alle / all
13440	5 Feinstrahldüsen Ø 0,8	5 fine blasting jets Ø 0.8	alle / all
13425	5 Feinstrahldüsen Ø 1,2	5 fine blasting jets Ø 1.2	alle / all
13426	1 Strahlgriffel ohne Feinstrahldüsen	1 jet pencil without fine blasting jets	alle / all
13491	1 Ring für Manschette	1 ring for sleeve	alle / all
13907	0,5 m Schlauch	0.5 m hose	alle / all
13911	0,9 m Dichtprofil	0.9 m sealing profile	alle / all
14095	1 O-Ring	1 o-ring	alle / all
14106	1 Kugelhahn	1 ball valve	alle / all
14112	1 Lampe	1 lamp	230 V
14113	1 Lampe	1 lamp	110 V
14115	1 Stopfen	1 plug	alle / all

ⓐ Bei Ersatzteilbestellungen bitte Bestell-Nr., Menge und Geräte-Nr. angeben.

ⓑ When ordering spare parts please quote Order No., quantity and equipment serial No.

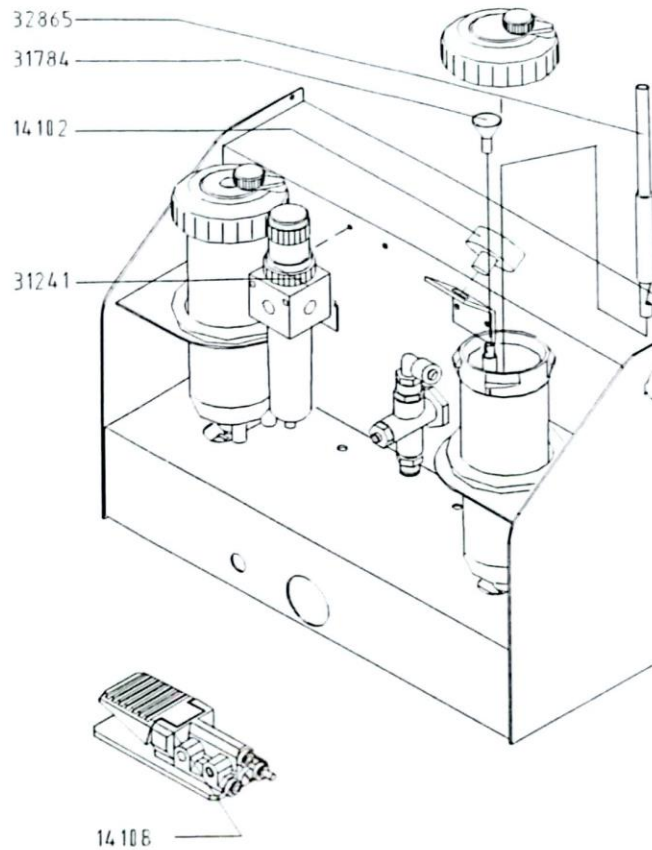
ⓒ Si vous commander des pièces de rechange, veuillez indiquer la référence de l'article, la quantité de pièces et No. de série.

ⓓ Al efectuar pedidos de piezas de recambio, se sirvan indicar el No. característico, la cantidad de cada pieza y No. de aparato

EasyBlast

Dok.-Nr. 85767/00
 gültig ab Geräte-Nr./valid from serial No./
 valable à partir du No. de série/válido desde la serie No
298.00001

Fig. 3



Bestell-Nr. Order No.	Ersatzteil-Bezeichnung	Spare part	Für Netzspannung For tension
14102	1 Manometer	1 pressure gauge	alle / all
14108	1 Fußschalter	1 foot starter switch	alle / all
31241	1 Druckregler	1 pressure regulator	alle / all
31784	1 Trichter	1 funnel	alle / all
32865	1 Injektorrohr	1 injector pipe	alle / all

- Ⓓ Bei Ersatzteilbestellungen bitte Bestell-Nr., Menge und Geräte-Nr. angeben.
- ⒼⒷ When ordering spare parts please quote Order No., quantity and equipment serial No.
- Ⓕ Si vous commander des pièces de rechange, veuillez indiquer la référence de l'article, la quantité de pièces et No. de série.
- Ⓔ Al efectuar pedidos de piezas de recambio, se sirvan indicar el No. característico, la cantidad de cada pieza y No. de aparato.

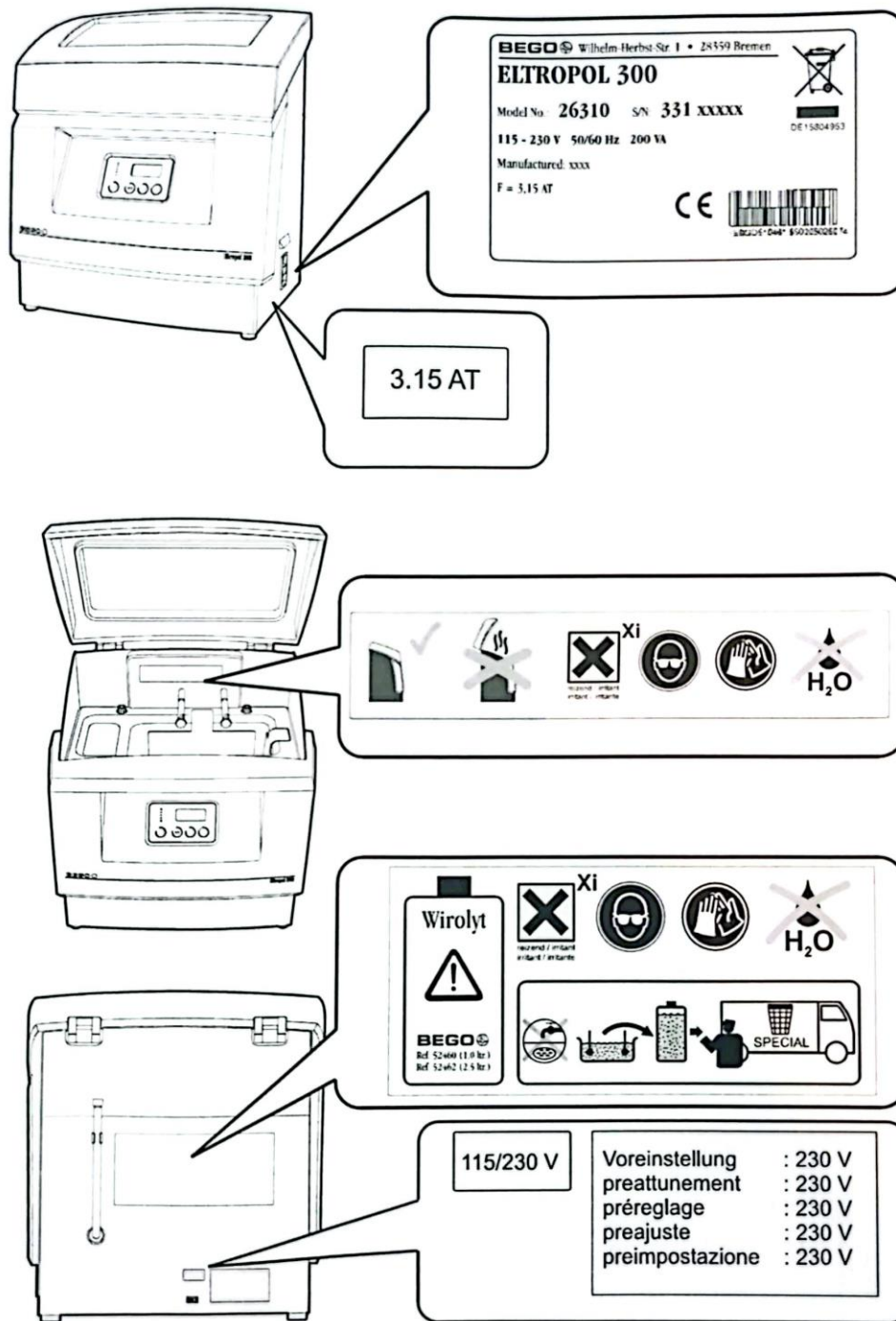


Figure 3 ELTROPOL 300

Safety instructions

Eltropol 300 is exclusively designed for the electrolytic polishing of Co-Cr partial denture bases using Wirolyt polishing solution. Any other use is considered improper. We shall not be liable for any damage resulting from improper use.

One example of improper use is the heating of water, other liquids, or foodstuffs!

The safety instructions must be followed in order to avoid personal injury or damage to equipment. We shall not be liable for failure to comply with the safety instructions.

General safety instructions

- **Information for staff**

The unit may only be operated by staff who are familiar with and comply with the contents of these operating instructions. • The operating instructions must be easily accessible during operation of the unit. • In addition to these operating instructions, the national accident prevention regulations must be observed.

- **Handling the unit**

The unit must be placed on a sufficiently stable surface. • The unit may only be used in an enclosed space. • Prior to making the electrical connection, check whether the specifications on the rating plate conform to those of the supply network. In the event of uncertainty consult a specialised staff member. • The unit is categorised under protection class 1 and may only be connected to properly earthed power sources (earth contact sockets). • No modifications may be made to the unit. • Maintain signs and stickers in good legible condition. They must not be removed. • Check the unit and the leads regularly for damage. The unit must not be operated if it has defects

that may endanger employees or third parties.

- Protect the leads against heat, oil and sharp edges. The leads must not be used to carry the unit or to pull out the plug.

- **Care and maintenance**

Switch off the unit and pull out the plug prior to any care, cleaning or maintenance. • Use only dry or slightly moist cloths for cleaning purposes. Do not splash the unit with water or immerse it in water.

- **Repairs**

Generally repairs may only be carried out by customer service personnel or persons recommended by them. • **The metal casing** must be earthed in line with current regulations to prevent it from becoming electrically charged. Otherwise life may be endangered, since damage to the unit can cause the casing to become charged! Since it is a legal requirement each time the unit is opened to check for zero potential (Germany: inspection according to DIN VDE 0701-1), only qualified electricians are allowed to open the unit!

Special safety instructions regarding this unit

The unit is designed to be used with Wirolyt polishing solution.
CAUTION Wirolyt contains glycol and sulphuric acid!

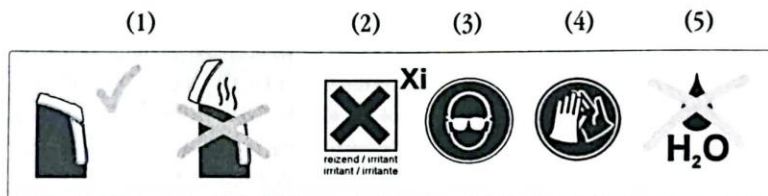
Hazard warnings (R phrases)

- R 22 Harmful if swallowed.
- R 36/38 Irritating to eyes and skin.

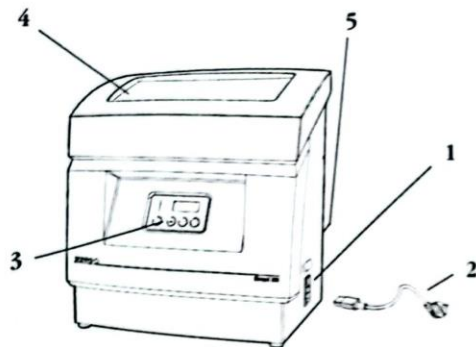
Safety instructions (S phrases)

- S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S 37 Wear suitable gloves.
- S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

- Only transport or store the unit when **empty of Wirolyt!**
- Only operate the unit when it is closed!
The fumes are a health hazard. (1)
- Wirolyt is classed under the international hazard symbol “Xi Irritant”. (2)
- Avoid contact with skin and eyes! Risk of blinding!
Wear safety glasses and safety gloves! (3), (4)
- **Never add water!**
When mixed, acid and water produce an extreme chemical reaction.
Spitting acid is the consequence! (5)
- Dispose of as hazardous waste! Used Wirolyt contains heavy metal ions –
do not allow it to enter the sewer system! (6)



Unit description

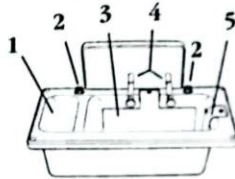


- 1 Main switch / fuse / mains connection
- 2 Power cable (EU / USA)
- 3 Control panel
- 4 Lid/cover
- 5 Voltage selector switch (230 V / 115 V)

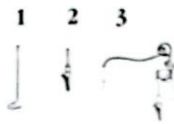
Polishing bath

- 1 Container for utensils (not for water!)
- 2 Contact for supplementary cathode
- 3 Cathode
- 4 Clips for object holder
- 5 Heating element

Polishing bath



Object holder



Object holder

- 1 Object hook
- 2 Crocodile clip with holder
- 3 Supplementary cathode

Eltropol 300 is designed for the electrolytic polishing of Co-Cr partial denture bases. One or two objects may be polished simultaneously.

● Intelligent technology

By gauging the electric current, the Eltropol 300 automatically proposes the optimum polishing time required according to object size and the temperature of the bath. If necessary, the proposed polishing time and current may be adjusted manually.

● Innovative heating concept

The polishing bath is brought to operating temperature and subsequently monitored using a unique procedure. This means that there are no unreliable heating elements and the bath heats up more quickly.

● Maintenance free

The use of stainless steel instead of copper means the object holders submersed in the polishing solution do not corrode, thus preventing sediment from

accumulating.

Other measures designed to minimise wear are a reduction in the number of moving parts by means of a magnetic stirrer and an outer casing made of stainless steel with an additional coating of electrolyte-resistant paint.


● Simplified bath emptying

The control panel indicates when it is time to change the polishing solution. A drainage tube on the back of the unit makes it convenient and safe to drain the solution directly into a waste canister.

● Safety

The operating temperature of approx. 40°C is monitored electronically. At temperatures exceeding 60°C the unit displays an error message and cuts out. An additional independent control circuit causes the unit to shut down automatically at temperatures over 70°C. The unit may only be switched on again once it has cooled down.

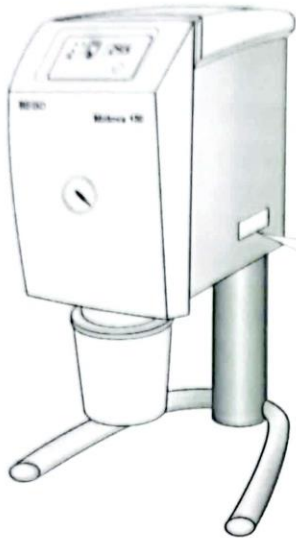
Scope of delivery, accessories and consumables

Scope of delivery	Ref. Nr.	Accessories (optional)		Ref. Nr.
<ul style="list-style-type: none"> Eltropol 300 (115 / 230 V) 	26 310	<ul style="list-style-type: none"> straight cathode for the supplementary cathode 		17 003
<p>with:</p> <p>polishing bath, 2 magnetic stirrers, 2 object hooks, 10 crocodile clips, 1 supplementary cathode, 1 spare clamp with holder, 2 power cables (EU or USA plug), documentation</p> <p>Please see the replacement parts list when purchasing for the first time.</p>		<p>Consumables</p> <ul style="list-style-type: none"> Wirolyt polishing liquid (1 litre) 52 460 Wirolyt polishing liquid (2.5 litres) 52 462 Seculac removable masking lacquer (10 ml) 52 696 		


Technical Data


Height / width / depth	452 / 400 / 275 mm	Rated voltage	115 / 230 V, 50/60 Hz
Weight (empty)	10 kg	Maximum power consumption	200 W
Capacity of polishing bath	2 litres	Noise emission	< 70 dB (A)

Motova 100






BEGO Wilhelm-Herbst-Str. 1 D-28359 Bremen

Motova 100 

Model No.: 26280 S/N: 327 XXXXX  DE 1509495.1

230 V 50/60 Hz 500 VA

Manufactured: 20xx

   +86G0510481530200029074

BEGO Wilhelm-Herbst-Str. 1 D-28359 Bremen

Motova 100 

Model No.: 26281 S/N: 327 XXXXX  DE 1509495.1

110 V 50/60 Hz 500 VA

Manufactured: 20xx

   +86G0510481530200029074

BEGO  (0421) 2028 - (270 bis 274)

 +49 421 2028 - (270 ... 274)

© 2008 by BEGO Jan 08

BEGO 

Figure 4 MOTOVA 100 VACCUM MIXER

Safety instructions

Motova 100 is designed exclusively for the mixing of investment materials, silicone, plaster or other forming materials in dental engineering. Any other use is not regarded as the proper intended usage. We will not be liable for any damages resulting from improper use.

The safety instructions must be followed in order to prevent personal injury or damage to the device. We will not be made liable for failure to observe the safety instructions.

General safety instructions

- **Employee information**

The device must only be used by employees who are familiar with and follow the contents of this operating manual. • The operating manual must be easily accessible when operating the device. • National regulations for the prevention of accidents must be adhered to as well as this operating manual.

- **Using the device**

Prior to connection to the power supply, check that the specifications on the rating plate correspond to the supply network. In the case of uncertainty, consult an electrician. • **The device has been produced in accordance with DIN EN 61010, class of protection 1 and may only be connected to a properly grounded power source (fuse contact socket).** • Modifications to the device must not be carried out. • Signs and stickers must be maintained in legible condition. They must not be removed. • The device and the feed lines must be checked for damages regularly. The device must not be operated if defects are discovered which may endanger employees or third parties. • Protect the feed lines from heat, oil and sharp edges. The feed lines must not be used to carry the device or to pull the plug from the mains.

- **Servicing, cleaning, maintenance**

Switch off the device and pull the plug from the mains before servicing, cleaning or maintenance work. • Only ever use dry or slightly damp cloths for cleaning. Do not splash the device with water or submerge it in water.

- **Repairs**

In general, repairs may only be carried out by customer service or authorised persons. • **Metallic housings** must be correctly grounded to prevent them from conducting electrical voltages. Otherwise there is a risk to life as the housing could be live if there is any damage in the device! As the device must be tested for voltages each time the device is opened (Germany: test as per DIN VDE 0701-1) only qualified electricians are permitted to open the device!

Special safety instructions for the device

- The mixing bowl is held onto the device by vacuum. **If the vacuum is insufficient, the mixing bowl will fall down!** The mixing bowl must therefore be held firmly after the start of the mixing process (until sufficient vacuum is built up) and after the mixing process is complete!
- **Large, filled mixing bowls are heavy!** When the mixing process is complete, hold the mixing bowl with both hands and be prepared to carry the weight.

The device

Description

Motova 100 is a vacuum mixing device for the mixing of investment materials, silicone, plaster and other forming materials in the dental laboratory.

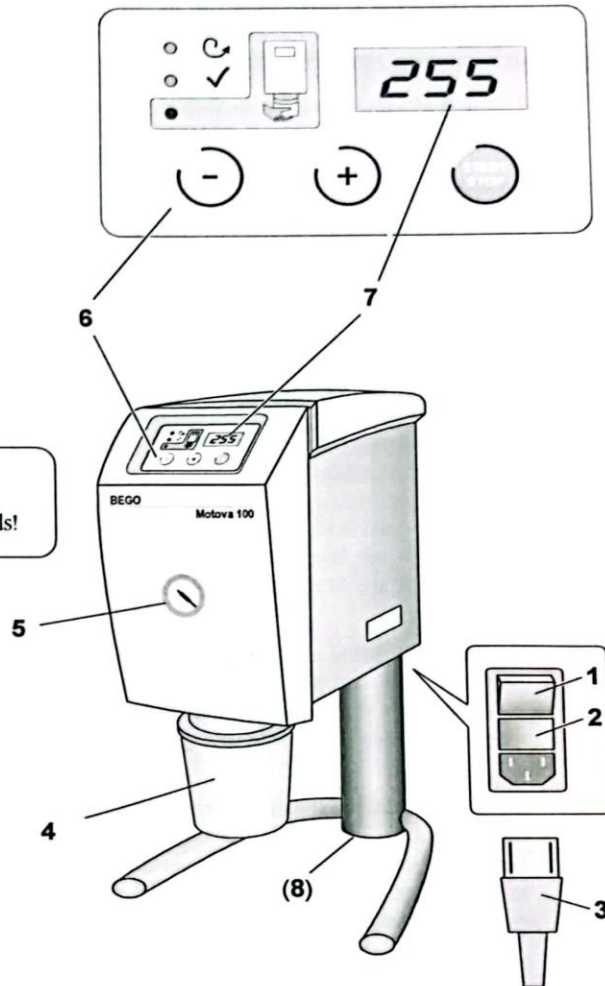
The mixing duration can be set between 1 and 255 seconds. In addition, a post-evacuation time between 1 and 30 seconds can be set.

The mixing bowl is connected to the device with a vacuum.

The vacuum is insufficient at the start and confirmed end of the mixing process: the mixing bowl must be held firmly in the hands!

Components:

- 1 Main switch
- 2 Safety switch
- 3 Mains cable
- 4 Mixing bowl
- 5 Manometer
- 6 Keyboard
- 7 Display
- 8 Table stand (accessories)



Technical data

Nominal voltage	.....	230 V ± 10 %, 50 / 60 Hz
Special voltage	.....	110 V ± 10 %, 50 / 60 Hz
Power consumption	.....	max. 500 VA
Vacuum pump:	Pumping speed	..... 20 l/min
	Vacuum	..... approx. 100 mbar
Adjustable mixing duration	.....	from 1 to 255 sec.
Speed range	.....	420 rpm
Dimensions: Length / width / height	.....	330 / 210 / 310 mm
Weight (without mixing bowl)	.....	10.1 kg
Noise emission	.....	<70 dB (A)

Filling

- Select the appropriate mixing bowl:

- a) Mixing bowls in the **M series**:
for investment material and plaster, no silicone



Mixing bowls in the **MS series**:
only for silicone.



- b) The filling level must lie between the **min** and **max** markings!
The markings are different in the M and MS mixing bowls.

If the mixing bowl is too small:
Damage to the device by mixing material entering the air filter.

If the mixing bowl is too large:
Insufficient mixing.



- Fill the mixing bowl, spatulate sufficiently and attach cover with stirrer.




The sealing surfaces between the mixing bowl and the cover (O-ring) must be clean so that a vacuum can be created!

Note

- Comply with the working instructions for the selected mixing materials!
- To avoid delays, select or set the mixing duration and - where necessary – the time for post-evacuation before filling the bowl!
- Mixing bowls that are used for silicone must not be used for other materials!


Mixing

- Push the mixing bowl with cover into the holder **1** and hold firmly with the hand!
- Press the **Start/Stop** key:
The vacuum is generated and displayed on the manometer **2**.

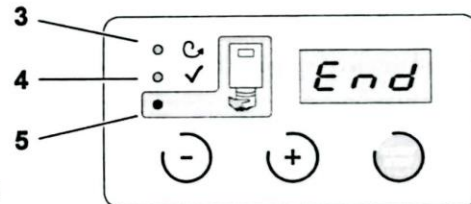
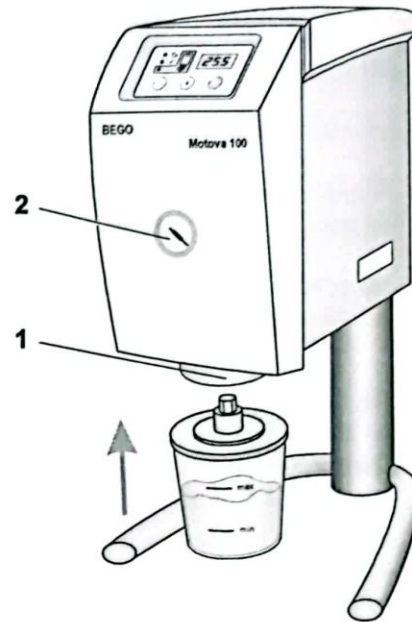
 Hold the mixing bowl firmly until the manometer displays 0.8 bar.

- To start stirring, press the **Start/Stop** key again. *
 - Mixing begins and the lamp **3** lights up green.
 - The display shows the remaining mixing duration in seconds.
 - If post-evacuation has been set, the display then shows the remaining post-evacuation time in seconds.
 - After mixing: The display shows **End**. A warning signal sounds and the lamp **4** lights up green.

- End evacuation:
Press the **Start/Stop** key.
The vacuum is released and the lamp **5** lights up red.

 Hold the mixing bowl firmly!
Large, filled mixing bowls are heavy!
Hold the mixing bowl with both hands and be prepared to carry the weight.

- Remove the mixing bowl as soon as the vacuum is too weak to hold the mixing bowl any longer.



Note

- * Pressing the **Start/Stop** key a second time means to start the stirring. - If evacuation has to be interrupted before (for example, because insufficient vacuum was generated to hold the mixing bowl), the **Start/Stop** key must be kept pressed for approx. 3 seconds.
- Once the **Start/Stop** key is pressed the second time, the mixing can be interrupted at any time with the **Start/Stop** key.
- After mixing silicone, remove the cover and stirrer slowly and evenly out of the mixture to avoid introducing air and thus air bubbles!
- Cleaning the mixing bowl and cover/stirrer: For investment materials and plaster, clean with water and brush **before the material starts to harden**. Pull off the silicone once it has hardened.

KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY
CERTIFICAT DE CONFORMITÉ
DICHIARAZIONE DI CONFORMITÀ
DECLARACIÓN DE CONFORMIDAD
DECLARAÇÃO DE CONFORMIDADE

ivoclar
vivadent
BENDERERSTR. 2
FL-9494 LIECHTENSTEIN
TEL ++423 / 235 35 35
FAX ++423 / 235 33 60



Produkt / Product / Produit / Prodotto / Producto / Produto

Programat EP 3000

- DE** Hiermit erklären wir in alleiniger Verantwortung, dass das oben aufgeführte Produkt den erwähnten Normen entspricht.
Gemäss den Bestimmungen der EU-Richtlinie(n)
- GB** We herewith declare that the product listed above complies with the mentioned standards following the provisions of Directive(s).
- FR** Par la présente, nous déclarons que le produit ci-dessus indiqué est conforme aux normes énoncées.
Conformément aux dispositions de la (des) Directive(s) CE.
- IT** Con la presente dichiariamo sotto la nostra responsabilità, che il prodotto sopra menzionato corrisponde alle norme citate.
Secondo le disposizioni della/e Direttiva/e CEE.
- ES** Por la presente declaramos que el producto arriba indicado cumple con las normas citadas siguiendo las indicaciones de la Directiva.
- PT** Declaramos que o produto citado cumpre as normas mencionadas.
De acordo com as especificações da(s) Diretriz(es).

73/23/EWG 89/336/EWG 93/68/EWG	EN 61010-1 2001 2nd Ed IEC 61010-1 2001 2nd Ed UL/CSA 61010-1 2004 2nd Ed EN 61010-2-010 2003 2nd Ed IEC 61010-2-010 2003 2nd Ed CSA 61010-2-010 2004 2nd Ed IEC 61000-3-2 2005 IEC 61000-3-3 1994 + A1 2001 IEC 61326-1 2005 EN 61326-1 1997 + A1.1998
--------------------------------------	--

Bürs, 25.02.2008

Schaan, 25.02.2008



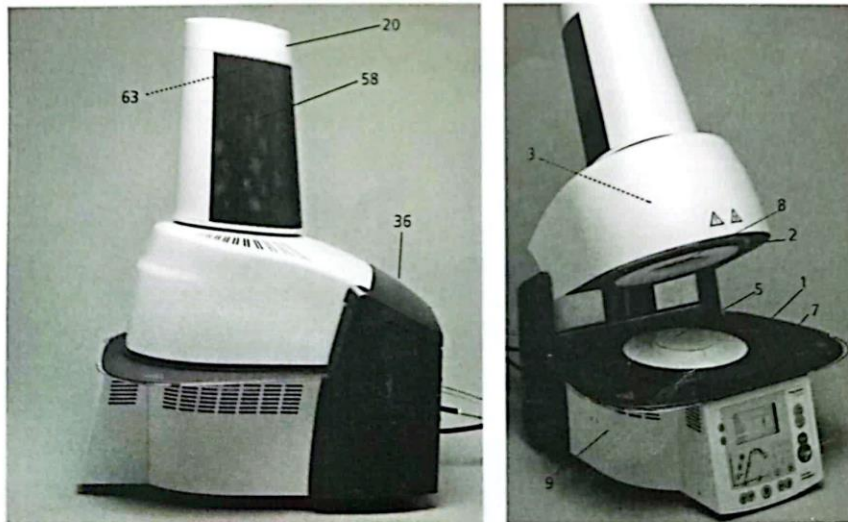
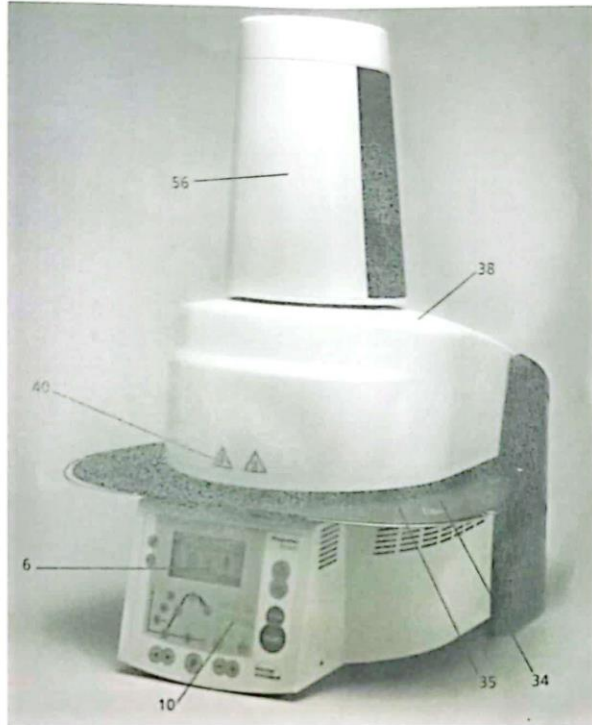
Siegbert Koch
Geschäftsleitung Produktion⁽¹⁾
Ivoclar Vivadent GmbH, A-6706 Bürs



Gottfried Rohner
Entwicklungsleitung Geräte⁽²⁾
Ivoclar Vivadent AG, FL-9494 Schaan

⁽¹⁾ Board of directors Production / Membres du Directoire Production / Direzione Produzione / Miembro consejo administración, Director de Producción / Diretoria de Produção
⁽²⁾ Head of Equipment Development / Responsable du développement des appareils / Direzione sviluppo apparecchiature / Jefe de Desarrollo de Aparatos / Direcção de Desenvolvimento de Equipamentos

Rev 00



5

Figure 5 PROGRAMAT EP 3000 (PRESS FURNACE)

2.2 Health and safety instructions

This furnace has been designed according to EN 61010-1 and has been shipped from the manufacturer in excellent condition as far as safety regulations are concerned. To maintain this condition and to ensure risk-free operation, the user must observe the notes and warnings contained in these Operating Instructions.

- Place furnace on a fire-proof table (observe local regulations, e.g. distance to combustible substances or objects, etc.).
- Always keep the air vents at the rear of the furnace free from obstruction.
- Do not touch any parts that become hot during operation of the furnace. There is a burn hazard.
- Clean furnace only with a dry or slightly moist cloth. Do not use any solvents. Disconnect power before cleaning.
- Use original packaging for transportation purposes.
- The furnace must be cool before it is packed for transportation.
- The user must especially become familiar with the warnings and operating conditions to prevent injury to personnel or damage to materials. The manufacturer is not responsible for damage resulting from misuse or failure to observe the Operating Instructions. Warranty claims cannot be accepted in such cases.
- Before switching on the furnace, make sure that the voltage indicated on the rating plate complies with your local power supply.
- The power socket must be equipped with a residual current circuit breaker.
- The furnace must be plugged into a socket with protected contacts.
- Before calibration, maintenance, repair, or exchange of parts, the power must be disconnected if the furnace is to be opened.
- If calibration, maintenance, or repair has to be carried out with the power connected and the furnace open, only qualified personnel, who are familiar with the risks and dangers, may perform these procedures.
- After maintenance, the required safety tests (high voltage resistance, protective conductor, etc.) have to be carried out.
- Ensure that only fuses of the indicated type and rated current are used.
- If it is assumed that safe operation is no longer possible, the power must be disconnected to avoid accidental operation. Safe operation is no longer possible if
 - the furnace is visibly damaged
 - the furnace does not work
 - the furnace has been stored under unfavourable conditions over an extended period of time
- Use only original spare parts.
- The temperature range for faultless operation is +5 °C to +40 °C (41 °F to 104 °F).
- If the furnace has been stored at very low temperatures or high atmospheric humidity, the head has to be opened and the unit dried or left to adjust to room temperature for approx. 1 hour (do not connect the power yet).
- The furnace has been tested for use at altitudes of up to 2000 m above sea level.
- The furnace may only be used indoors.
- Do not run the furnace via an extension cord.
- When placing and removing the investment ring, make sure not to hit the insulation of the firing chamber.
- There is a burn hazard at the cooling tray if the furnace is continuously operated in the press mode (stand-by = 700 °C).



Any disruption of the protective conductor either inside or outside the furnace or any loosening of the protective conductor connection may lead to danger for the user in case of a malfunction. Deliberate interruptions are not tolerated. Materials developing harmful gases must not be fired.

Warnings regarding the removal of the heating muffle



This product contains ceramic fibres and may release fibre dust. Fibre dust has proved to be carcinogenic in animal experiments. The corresponding EU Safety Data Sheet must be observed.

The heat insulation of the firing chamber in the Programat EP 3000 consists of ceramic fibres. After prolonged use of ceramic fibres at temperatures of over 900 °C (1652 °F), silicogenic substances (Cristobalite) may be produced. In certain cases, e.g. upon changing of the heating muffle, the possible resulting dust exposure may cause irritation of the skin, eyes, and respiratory organs. Therefore, proceed as follows when changing the heating muffle:

- Make sure the corresponding staff wears long-sleeved clothing, as well as headgear, goggles, and gloves.
- Place suction equipment at the source of the dust or, if not possible, provide the staff with FFP3 facemasks or similar items.
- Once the procedure has been completed, any dust possibly adhering to exposed skin must first be rinsed off with cold water. Only after that should soap and warm water be used.
- The corresponding work clothes should be washed separately.

Warning

The insulation on this product contains refractory ceramic fibres (RCF) which pose a possible cancer hazard, if agitated and inhaled. May be irritating to the skin, eyes or respiratory tract if insulation is cracked or corrupted.

California Proposition 65

Warning: "This product contains Refractory Ceramic Fibres, a substance known to the State of California to cause cancer."



Disposal:

The furnaces must not be disposed in the normal domestic waste. Please correctly dispose of old furnaces according to the corresponding EU council directive. Information on the correct disposal may also be found on your local Ivoclar Vivadent home-page.

3. Product Description

3.1 Components

The Programat EP 3000 comprises the following components

- Furnace base with electronic controls
- Furnace head with firing chamber
- Firing table
- Cooling tray
- Power cord and hose for vacuum pump
- Vacuum pump (accessories)

3.2 Hazardous areas and safety equipment

Description of the hazardous areas of the furnace

Hazardous area	Type of risk
Firing chamber	Risk of burning
Opening/closing mechanism	Risk of crushing
Electrical components	Risk of electrical shock

Description of the safety equipment of the furnace

Safety equipment	Protective effect
Protective conductor	Protection from electrical shock
Electrical fuses	Protection from electrical shock

3.3 Functional description

The firing chamber may be heated up to max. 1200 °C (2192 °F) by means of a heating element. Furthermore, the firing chamber has been designed in such a way that a vacuum may be created with a vacuum pump. The firing process is controlled with the corresponding electronic controls and software. Moreover, the set and actual temperatures are continuously compared.

3.4 Accessories (not part of the delivery form)

- Temperature Checking Set 2
- Programat Accessories Set (large and small firing trays, firing tongs, Temperature Checking Set)
- Vacuum pump

7. Maintenance, Cleaning, and Diagnosis

This chapter describes the user maintenance and cleaning procedures for the Programat EP 3000. Only those tasks are listed that may be performed by dental professionals. All other tasks must be performed by qualified service personnel at a certified Ivoclar Vivadent Service Center.



This furnace has been developed for typical use in dental laboratories. If the product is used in a production enterprise, for industrial applications, and for continuous use, premature ageing of the expendable parts has to be expected.

The expendable parts are as follows:

- Heating muffle
- Insulation material

Expandable parts are not covered by the warranty. Please also observe the shorter service and maintenance intervals.

7.1 Monitoring and maintenance

The time for these maintenance procedures depends on the frequency of use and the working habits of the users. For that reason, the recommended times are only approximations.

What	Part	When
Check all plug-in connections for correct fit	Var. external connections	weekly
Check if the furnace head opens smoothly and without excessive noise.	Opening mechanism	monthly
Check if the thermocouple is straight and in the right place.	Thermocouple (4)	weekly
Check the insulation for cracks and damages. If the insulation is worn down it has to be replaced by a certified Ivoclar Vivadent Service Center. Fine hairline cracks on the surface of the insulation are harmless and do not influence the function of the furnace in a negative fashion.	Insulation (3)	monthly
Check if the sealing rims of the furnace head and the furnace base are clean and undamaged.	Sealing rims of the furnace head (2) and the furnace base (1)	weekly
Check the keypad for visible damage. If the keypad is damaged, it has to be replaced by a certified Ivoclar Vivadent Service Center.	Keypad (10)	weekly
Check temperature. Use the temperature checking set to check and adjust the temperature in the furnace.	Firing chamber	twice a year
Check the quartz glass cylinder to make sure the quartz glass is not defective.	Firing chamber	daily



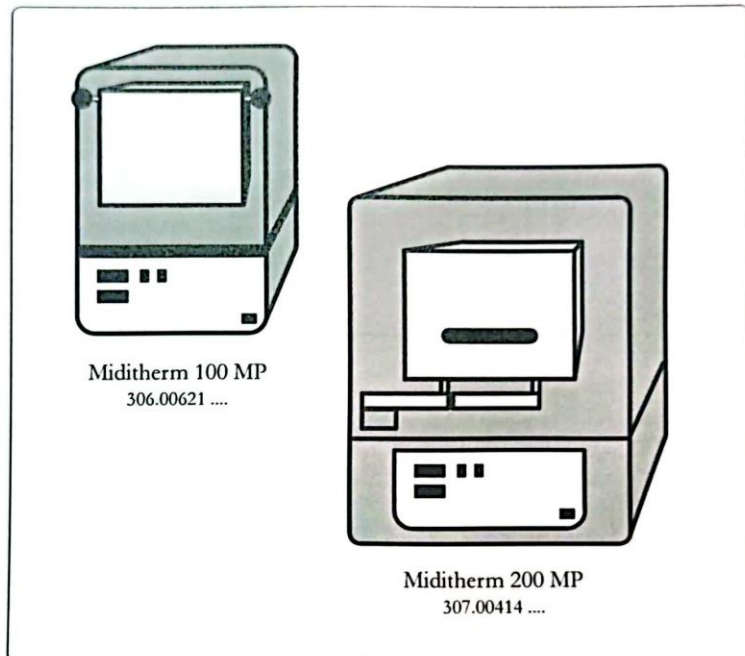
In general, the furnace head should not be replaced since the components (furnace head and furnace base) have been coordinated with each other. However, if the furnace head must be replaced for maintenance reasons, subsequent temperature calibration is required.

BEDIENUNGSANLEITUNG

Operating instruction
Instructions de service
Instrucciones de servicio

Miditherm MP

SV



85 818/ 05

BEGO    (0421) 2028 - (270 bis 274)
 +49 421 2028 - (270 ... 274)

© 2008 by BEGO Feb '07

Figure 6 MIDITHERM 100 MP (PREHEAT FURNACE)



Miditherm is designed exclusively for wax removal from and preheating of dental objects, such as duplicate models and casting moulds made of commercially available investment materials. Any other use is considered to be improper. We shall not be liable for any damage resulting from improper use.

The safety instructions must be followed in order to prevent injury to persons or damage to equipment. We shall not be liable for injury or damage due to the failure to comply with the safety instructions.

General safety instructions

- The unit may only be operated by staff that is familiar with the contents of these operating instructions and follows them. ● The operating instructions must be easily accessible during operation of the equipment. ● The national accident prevention regulations must be complied with in addition to these operating instructions.
- The unit may only be installed on an adequately stable surface. ● Prior to power connection check whether the data on the rating plate correspond to the power supply network. In the case of lack of clarity, consult a qualified electrician. ● Modifications may not be carried out on the unit. ● Always keep signs and stickers in easily legible condition. They must not be removed. ● Check the unit and supply leads for damage regularly. The unit must not be operated if it has defects that may endanger employees or third parties. ● Protect the supply leads against heat, oil and sharp edges. The leads may not be used to carry the unit or to pull out the plug.
- Switch off the unit and pull out the mains plug prior to any care, cleaning or maintenance. ● Use only dry or slightly moist cloths for cleaning purposes. Do not spray the unit with water or immerse it in water. ● Have repairs, particularly of electrical parts, carried out only by qualified specialists or the after-sales service staff.

Special safety instructions regarding this unit

- **Installation, site of installation and start-up**
 - Install unit only on adequately stable and non-combustible surface.
 - Because of the wax vapours, install the furnace under a chimney stalk as far as possible. **Always discharge vapours outdoors.**
 - Only use the furnace in dry rooms.
 - There must not be any combustible objects in the area near the furnace.
 - There must not be any highly flammable or explosive gas, liquids or solid material in the same room as the furnace.
 - Always connect the furnace to a separate circuit with 16-ampere fuse protection.
 - The unit is subject to safety class I and may only be connected to properly grounded power sources.
 - Use the rear plug only for connecting the Regulus furnace suction extraction unit (200-240 V).
 - Remove transport protection device from the mould chamber prior to start-up!


Creating a new program for shock heat investment materials

SHOCK HEAT





 **0 to 15 mins**

So-called shock heat investment materials are not heated up slowly, but are placed in a furnace that has been preheated to the final temperature. As a result, the modelling material burns atypically, i.e., if the furnace door is opened, inflowing oxygen can cause a darting flame!

 Place all moulds in the furnace within 10 seconds; then keep the furnace door closed for 15 minutes!

The cut-out of the *Regulus* furnace extraction system is set to 600°C at the factory. Shock heat investment materials are placed in the furnace at a higher temperature and produce concentrated smoke gases in a short space of time.

 For shock heat investment materials, the *Regulus* furnace extraction system (Ref. 25750) must be installed.

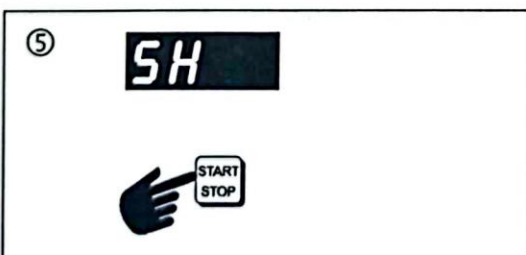
 *Regulus* must be set to continuous operation (see below).


① to ③ see “Creating a new program”

④ Call up and set the parameters at holding level 1:


- heating-up speed: 0°C/min. (= max.)
- temperature of the holding level:
see investment material
- duration of the holding level:
see investment material

Set the parameters of holding levels 2, 3 and 4 to zero.



⑤ Press  to set the extraction system to **continuous operation**. The display shows “SH” (shock heat). (Press again to deactivate.)

⑥ Exit programming mode:

keep  depressed until the LED “°C” lights up.



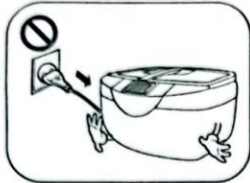
FEATURES:

- 1** Lengthened tank Suitable for long dental equipment and tube;
- 2** Stronger transducer To get better cleaning effect;
- 3** 5 Recycle digital timer Choose different time to clean;
- 4** Heater Safety and reliable with temperature (65°C) and time (45mins) controller;
- 5** Circuit protector Protect the circuit to lengthen unit life;
- 6** Radiator Fan To protect every parts in good condition after working a long time;
- 7** Wet-proof PCB Good to be used in lab;
- 8** Three separable wires Safety and convenient;
- 9** Industry IC To be steady in unstable voltage condition;
- 10** Strong plastic housing Better water-proof and drop-proof ability than metal.

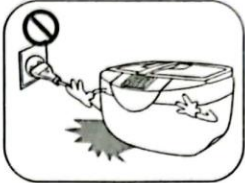
Figure 7 ULTRASONIC BATH

SAFETY INTRODUCTIONS

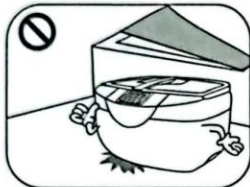
⚠ DANGER- To reduce the risk of electrocution:



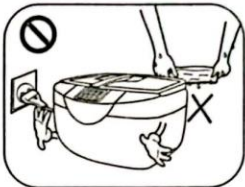
Unplug this unit immediately after using.



Do not immerse the unit into water or other liquid.



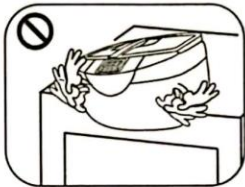
Keep the unit in a safe place to avoid falling into water or other liquid.



Do not use while bathing.



Do not reach for the unit that has fallen into water. Unplug it immediately.

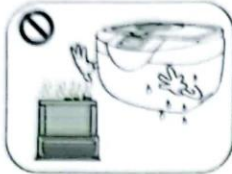


Do not place or store product where it can to or be pulled into a tub or sink.

⚠	<p>Do not place or drop into water or other liquid. To avoid damage may caused by high temperature, please shut down the cleaner for no less than 3 minutes and change the used water after three 480s working circles.</p>
	<p>The product may be off or can't be switch off when it is subjected to electromagnetic interference like Fast Transients. If it is occur please follow the instruction described in the manual to set the function again for operation.</p>
	<p>This appliance is not intended for used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliances by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance....</p>
	<p>This appliance has a polarized plug (one blade is wider than the other). As a safety feature, this plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician. Do not attempt to defeat this safety feature. (This only available for UL cord and plug)</p>
	<p>Don't use the product if there isn't water in the cleaning tank.</p>

SAFETY INTRODUCTIONS

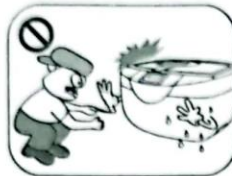
⊘ WARNING-To reduce the risk of burn or injury to persons



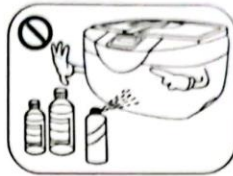
Keep the unit and the cord away heated surfaces, and place it on the dry and level surface.



The unit should never be left unattended when plugged in.



Do not disassemble the unit except for the authorized technician.



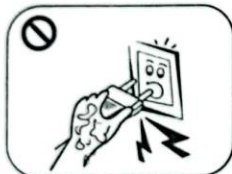
Do not fill the tank with abrasives or corrosive chemicals.



Unplug the unit before filling. Do not exceed the "MAX" mark.



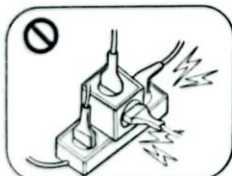
Do not immerse the unit into water to avoid electric shock.



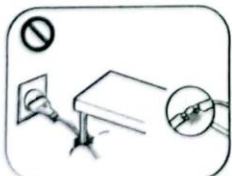
Do not touch the socket with wet hand to avoid electric shock.



Do not use this unit when sleeping or drowsy, and do not use outdoors or operate where aerosol (spray) products are being used or where oxygen is being administered.



Use the unit properly as per its instruction manual. Do not use attachments not recommended by the manufacturer.



Never operate this unit if cord or plug is damaged. If it is not working properly, damaged or has been dropped into water, return the damaged unit to a service centre for examination and repair.



Never drop or insert any object into any opening or hose.

Never block the air openings of the unit or place it on a soft surface, such as a bed or couch, where the air openings may be blocked. Keep the air openings free of lint, hair, and the like.

SAVE THESE INSTRUCTIONS



WHAT CAN NOT BE CLEANED

BIJOUTERIE Hawksbill, Pearl, emerald, Ivory, Coral, Agate.	Maybe the less rigidity of hawksbill or coral will be scrubbed, color changed or brightness lost caused by the rubbing of one object or surface against another.
PRECIOUS METAL Soldering metal, electro plating metal, bindings	Be broken off will be happened to the unsolid point of the soldering and binding items by ultrasonic cleaning. The cracked electro plating will be enlarged after cleaning
WATCH Watch, Pocket watch (Except the waterproof watch under 30m or more)	The water will be in the watch movement of little waterproof function for the ultrasonic strong osmosis occasionally.
OTHERS Wood, Glass, contact lens, ceramic, camera colored filter.	Maybe rift of ceramic, wooden items, or laminated glasses will be enlarged by ultrasonic cleaning. (It won't be happened for the item in perfect condition).

CS Scanned with CamScanner



OPERATION INSTRUCTIONS

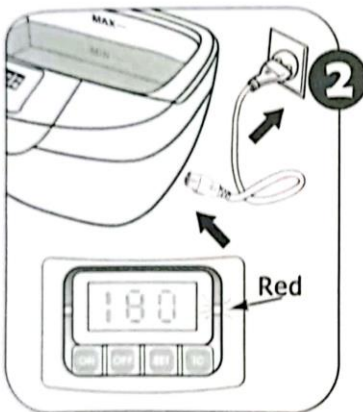


Open the lid, putting the products in the shift in line and then putting the shift in the tank.



To avoid the scratch and friction of the products, do not lap them over.

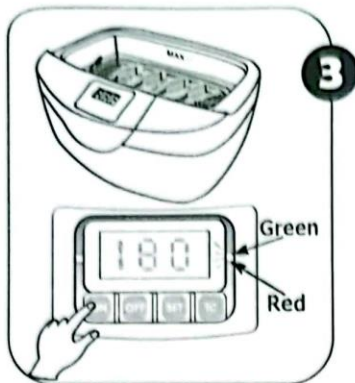
Add the water in the stainless steel tank, the water should over the surface of the product but within the range of MIN mark and MAX mark.



Inserting one side of the detachable plug and cord into the body of the machine, the other to the socket. (See picture).

180s will be displayed when the power is on. Press ON, it begins cleaning. 180s is the most common working cycle. During cleaning, the time displayed on the screen is the time left.

Pressing "SET", you can choose 5 optional working cycle: → 180S → 280S → 380S → 480S → 90S

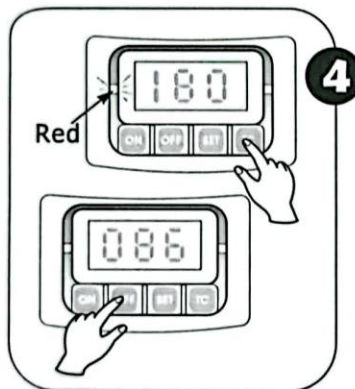


Press "ON" button to start cleaning while the right green indication light is on.

⚠ During cleaning, you can hear the "BUZZ" voice, it means the unit is working .

When the timer counts down "000", the unit will automatically stop. If required you can stop / pause the cleaning process at any time by pressing the OFF button, pressing the ON button again will resume the cleaning and the countdown will continue. When cleaning has finished, you can repeat the process by pressing ON button again.

⚠ This machine has a circuit protecting it when over heat. When the right red indication light is on, it means this circuit works. If pressing ON, the time left will be displayed but there is no ultrasonic wave. The machine needs to stop working for 15 minutes, then pressing ON and the right green light is on, the machine can work normally.



Using the HEATER function.

Pressing the TC button starts the built in heater. The red LED on the left of the control panel will illuminate. The water will heat to a maximum of 65 degrees C. Please refer to the ② point of four different ways of cleaning for details.

If required, you can stop / pause the cleaning process at any time by pressing the OFF button, pressing ON again will resume the cleaning and the countdown will continue. The program can be reset at any time by pressing the SET button.



When cleaning is finished, unplug it and open the lid, then take out the item. At last, pour away the water from stainless steel tank and wipe it up.

SPECIFICATION

Description	Digital Ultrasonic Cleaner	
Item No.:	CD-4820	
Rating voltage & frequency	AC 220~240V~ 50/60 Hz	
	AC 100~120V~ 50/60 Hz	
	AC 100V~ 50/60 Hz	
Consumption Power	AC 220~240V~ 170W	
	AC 100~120V~ 160W	
	AC 100V~ 130W	
Ultrasonic frequency	42,000 Hz	
Material of tank	Stainless steel SUS304	
Material of plastic housing	ABS 757	
Tank size (L X W X H)	250 x 150 x 80 mm	
	9.84 x 5.90 x 3.15 in	
Tank capacity	2500 ml (5.29 pt)	(MAX-) 2100ml 4.44pt
		(MIN-) 600ml 1.27pt
5 Recycle digital timer	180s→280s→380s→480s→90s	
Color box size	340 x 255 x 225 mm	
Net weight (N.W.)	2.5 Kg	
Gross weight (G.W.)	3.0 Kg	

List of Parts

- 1 Cable connection with bend protection
- 2 Power cord
- 3 Air vents
- 4 Vacuum hose connection
- 5 Housing
- 6 Connection tube
- 7 Transportation grip
- 8 Sound absorber
- 9 Sound absorber connection
- 10 Fuse (inside)
- 11 Protective cap
- 12 Rating plate
- 13 Rubber feet

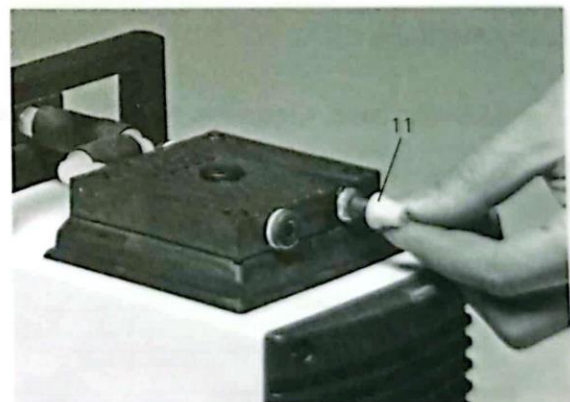
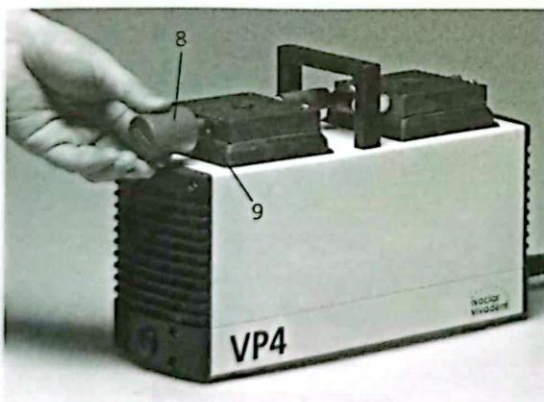
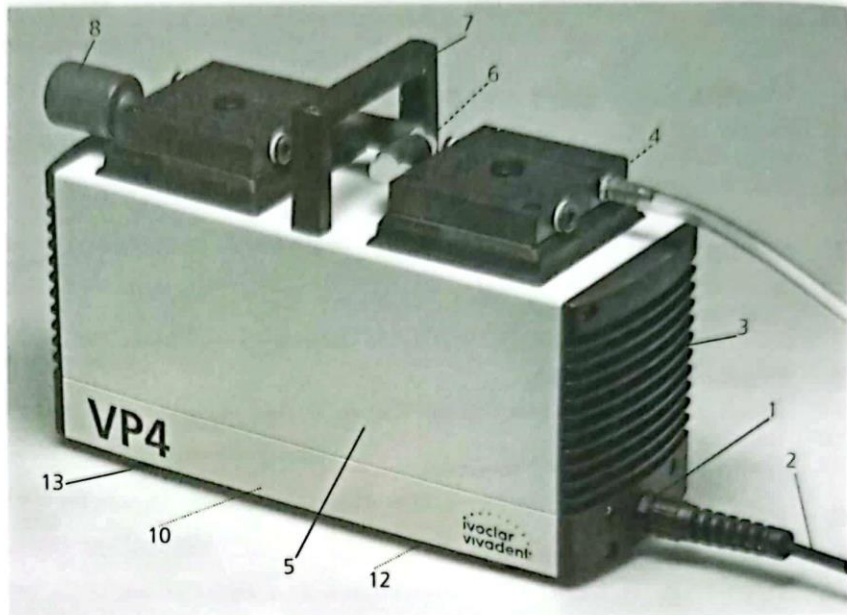


Figure 8 VACCUM PUMP FOR PRESS FURNACE

2. Safety First

This chapter is especially important for personnel who work with the VP 4 Vacuum Pump or who have to carry out maintenance or repair work. This chapter must be read and the corresponding instructions followed.

2.1 Indications

This vacuum pump has been developed especially for the evacuation of Programat ceramic furnaces from Ivoclar Vivadent and it should be used for this purpose only.

Other uses than the ones stipulated are contraindicated. The manufacturer does not assume any liability for damage resulting from misuse. The user is solely responsible for any risk resulting from failure to observe these Instructions.

Further instructions to assure proper use of the pump:

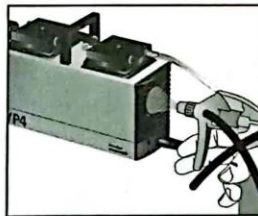
- The instructions, regulations, and notes in the vacuum pump Operating Instructions must be observed.
- The pump must be operated under the indicated environmental and operating conditions (Chapter 9).
- The VP 4 must be properly maintained.

2.1.1



Risks and dangers

Foreign objects or liquids must not enter the air vents, since this may block the motor or result in an electrical shock.



2.1.2



Risks and dangers


The connection cover must not be opened while the pump is connected to the power socket, since this may result in an electrical shock. The connection cover may only be opened by the personnel of a certified Ivoclar Vivadent Service Center.



The connection cover, which is marked with the label shown below, may only be opened once the power has been disconnected (interruption of the power supply) by qualified service personnel. Please observe the relevant rules and regulations, as well as other recognized safety and medical regulations.



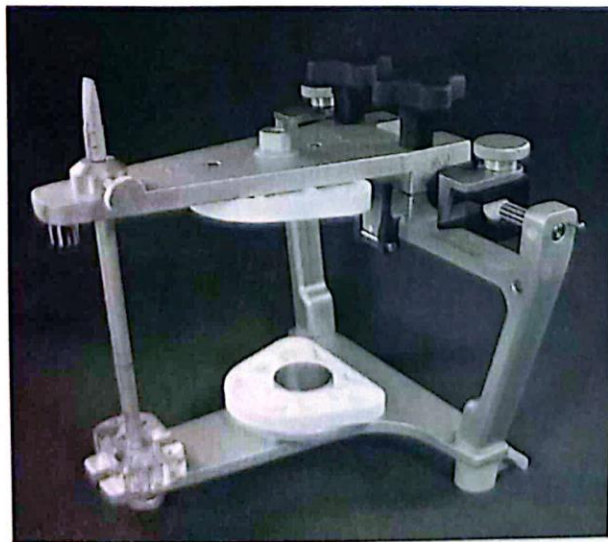
2.2 Health and Safety Instructions

- Make sure that the pump is only used for the indications stipulated in these Operating Instructions.
 - Do not use the pump in areas where there is an explosion hazard.
 - Components connected with the pump must comply with the pneumatic data of the pump.
 - Observe the corresponding safety regulations when connecting the pump to the electronic network.
 - If the operation of the pump is interrupted by the thermostat because of over-heating, the pump starts automatically once it has cooled down. Make sure that no danger results from such an incidence.
 - Observe the corresponding safety instructions for the media used.
 - Use only original spare parts.
 - The pump complies with the safety regulations of the following EC guidelines:
73/23 EEC (low voltage guideline)
89/336/EEC (electromagnetic compatibility)
 - If the pump has been stored at very low temperatures or high atmospheric humidity, the pump has to be dried or left to adjust to the room temperature for approx. 1 hour (do not connect to the power yet).
-  Do not work with liquids near the pump. Should a liquid accidentally enter the pump, disconnect power and consult Customer Service. Do not operate the pump
- The pump is tested for use at altitudes of up to 2000 m above sea level.
 - The furnace may only be used indoors.
 - The unit must not be technically modified.

WHIP MIX 3000 SERIES ARTICULATORS



Model 3040



Model 3140

CS Scanned with CamScanner

Figure 9 WHIP MIX 3000 SERIES ARTICULATORS

INTRODUCTION

WHIP MIX Articulators and QUICK MOUNT Face-Bows are designed to enable the user to quickly and easily mount casts of a patient's dentition on a mechanical device that will reproduce their natural relationship and movements with an acceptable degree of accuracy. The simplicity and speed with which the necessary registrations are obtained and transferred to a WHIP MIX Articulator enable the operator to accomplish corrective and restorative dentistry with much greater precision than has ever before been possible without the use of expensive equipment and time consuming techniques.

For those already using a fully adjustable instrument, a WHIP MIX Articulator serves as an excellent auxiliary instrument for diagnostic and patient education purposes, as well as constructing the clutches and recording devices needed to secure the proper recordings for setting the more complex instrument. Being arcon type instruments, WHIP MIX Articulators are ideal for the study of occlusion and the movements of the temporomandibular joints. With the condyle located on the lower frame and the guidance on the upper frame (arcon design), WHIP MIX semi-adjustable articulators have become the preferred choice of many teaching institutions. Advancing to a fully adjustable articulator becomes a much easier process after initial training on an arcon semi-adjustable articulator.

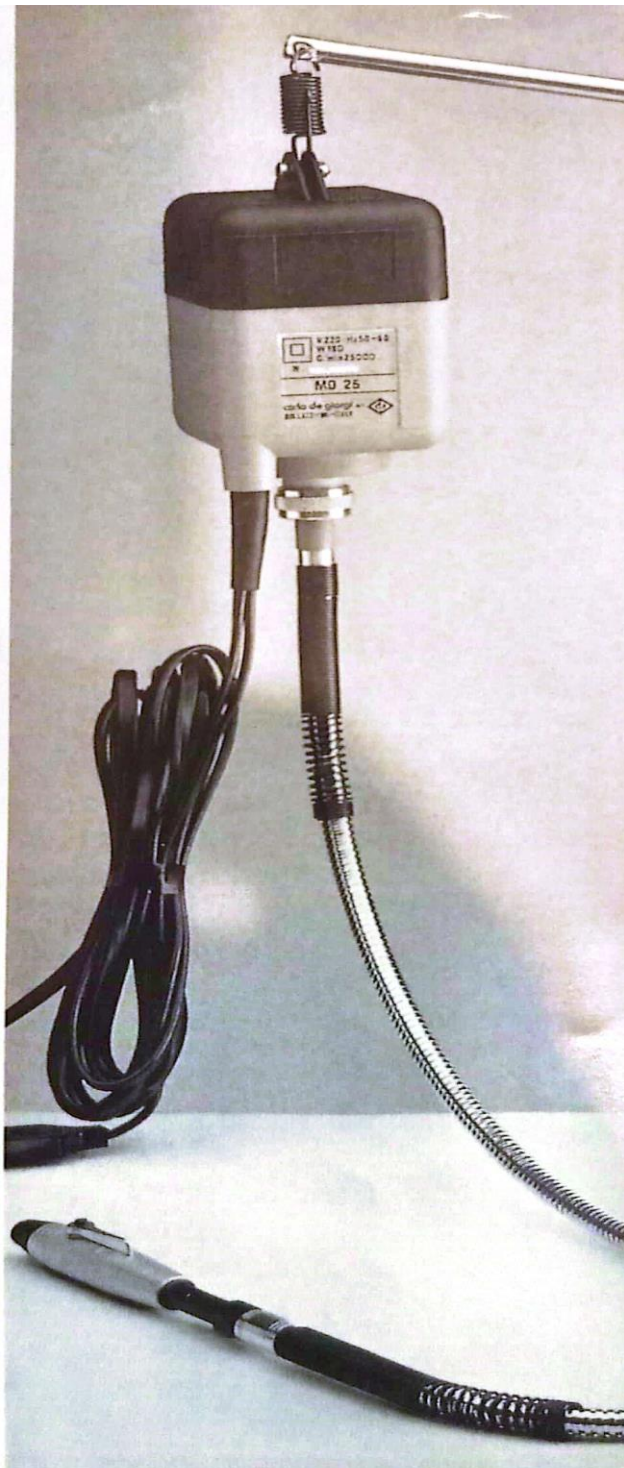
Series 3000 Articulators feature the same sturdy construction and reliability which have been demonstrated successfully in other WHIP MIX Articulator Series. In addition, the following innovative and useful features have been incorporated:

- Ergonomic design with wide lingual access and ample interframe distance.
- Tracking condylar guidance with progressive side shift capability.
- An easily positioned centric latch provides a quick way to return to centric position.
- A permanent intercondylar width of 110 mm — the same as the M setting found on other WHIP MIX Articulators.
- Elastics provide positive tracking of the condyles during excursive movements if secured.
- Condyle release mechanisms to prevent accidental separation of the condyles from the tracking condylar guidance.
- Non-skid rubber feet for stabilizing articulator when open

WHIP MIX Series 3000 Articulators feature the innovative ACCUMOUNT Mounting System of interchangeability. This makes it possible to interchange mounted casts between any Series 3000 Articulator without loss of accuracy.

As with other models in the WHIP MIX family of Articulators, a variety of accessories are available. Each Series 3000 Articulator is packaged with the following items:

- | | |
|--|---|
| 1 - Instruction Manual | 1 - #8580B Plastic Mounting Plate, Set of 2 |
| 1 - Serial Number Card | |
| 1 - #8580 Metal Mounting Plate, Set of 2 | |



CS Scanned with CamScanner

Figure 10 HANGING ENGINE

Art. 270 - Special high speed motor suitable for working of chrome-cobalt. Watts 200, 25,000 r.p.m.

Weight Kg. 2.5

Recommended Flexible Shaft:

S-TML/CS (art. 135), 6 mm core, special model on ball bearings.

N.B. It is possible to exchange motor/flexible-shaft pairings according to workings to be carried out.

CS Scanned with CamScanner

Laboratory hand-piece, T/30, (suitable for any type of flexible shaft) complete with 2.35 mm collet (3 mm upon request).

Feature of this hand-piece is the clutch allowing to replace the tool without waiting until motor is fully stopped.

CS Scanned with CamScanner



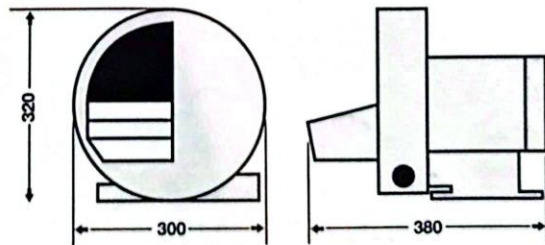
Figure 11 MODEL TRIMMER

165W
Intensité : 2A
Fusible : 3,15A

CS Scanned with CamScanner



mit Wiederherstellung Schalter
art. 650/00



Peso: Kg 14
Poids: Kgs 14
Weight: Kgs 14
Gewicht: Kg 14

Figure 12 VIBRATOR

Volvere Vmax = Higher Expectations

The brand-new Volvere is an improved version of an already established high performance tool.

The well-known Volvere, which is regarded as the best dental laboratory motor system, is now newly released with higher functionality, controllability and durability. NSK's long years of experience and persistent improvements have created another excellent tool.

The appearance has an updated and stylish form with a new metallic silver color. Space and weight saving design.



CS Scanned with CamScanner

Figure 13 HIGH TORQUE MICRO MOTOR

CONTROL UNIT



Volvere V-max Control unit

Power source : AC120V or 230V 50-60Hz
 Dimension : W95xD190xH180 mm
 Weight : 2.0kg

Unique design

Volvere Vmax will fit anywhere. Vertical placement allows you more working space. By placing it horizontally, it can also fit into small places, such as in a rack. Its stylish metallic silver color will fit the room's decor.



Microcomputer control

Knowledge obtained from many years of experience and NSK's cutting edge dental laboratory technologies are loaded into a high performance microcomputer and its CPU.

This microcomputer provides excellent controllability. The microcomputer constantly monitors the motion of the motor and provides smooth starting and stopping. If you change rotation direction while the motor is operating, the microcomputer waits until it confirms the complete stop of the motor, and then, it changes the rotation direction. The motor starts and stops without any jolts, thus making it easy on both the operator's hand and the motor.

Ecological design

Power consumption of the electric circuit is minimized for environmental concerns. Power loss, a cause of heat in a unit, is very low and no fan is necessary in this unit. This provides quietness as well as efficiency.

Auto Cruise function

The tool has a constant speed function that allows a fixed revolving speed without using a foot pedal. This function reduces foot fatigue when continuously working on similar products.

Error code display function

An error code is displayed for easy troubleshooting when any failure, overload or disconnection has occurred.

EMC compliant

NSK cares about invisible matters. This tool is compliant with the most strict European EMC* Regulations. It doesn't emit electromagnetic waves or noise that could cause a failure or malfunction in other electronic equipment, and it is also designed to be safe from the effects of electromagnetic waves from outside the tool.

*EMC (Electromagnetic Compatibility)

Double-digit display

Double-digit display indicates accurate revolving speeds.



Handpiece cradle

Optional handpiece cradle enables you to work while suspending the handpiece in the air. More space on the desk allows you more flexibility. Arm length is adjustable.



Suspending Handpiece Cradle (Option)

MOTOR HANDPIECE

Easy-to-hold, less tiring grip

We tirelessly pursued an easy-to-hold ergonomically designed grip. Weight balance has been enhanced, thereby reducing hand fatigue for longer working hours.

Built-in special anti-dust mechanism

Handpiece is enhanced with NSK-exclusive, special anti-dust mechanism. This mechanism prevents foreign matter from entering the bearings, thus ensuring high durability.

High precision

NSK high precision technology lowered the shaft deflection below 0.02 mm. This tool is perfect for very precise work.

Light and compact

Volvere Vmax Handpiece is light and compact, and is designed to fit into the operator's hand. All this contributes to excellent operability.

Low vibration & low noise

NSK high precision technology provides an optimal working environment with low vibration and low noise. Low vibration also contributes to precision processing.

Ring type Motor Handpiece

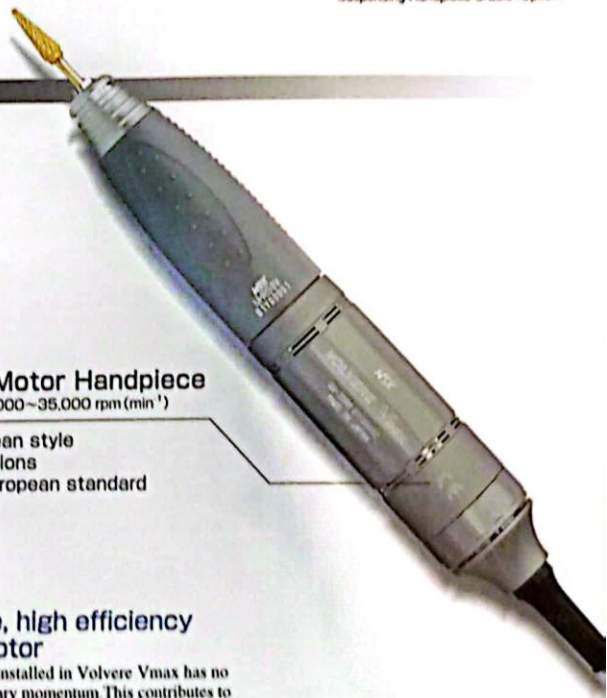
Rotation speed : 1,000~35,000 rpm (min⁻¹)


Smooth European style with no protrusions
 Palm grip, a European standard

High torque, high efficiency coreless motor

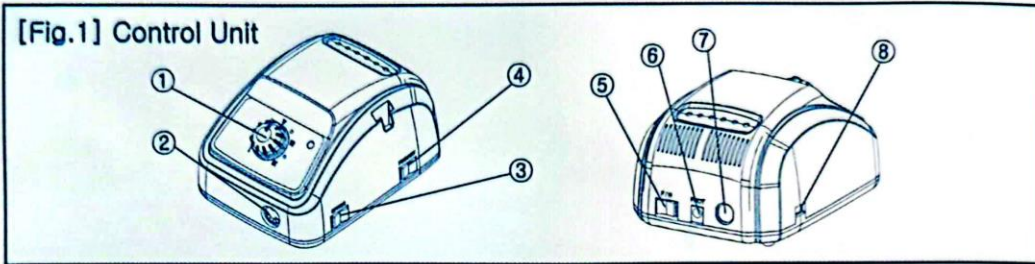
The coreless motor installed in Volvere Vmax has no core and has less rotary momentum. This contributes to the controllability of the rotation speed and reduces uneven rotation.

In addition, this motor has high power efficiency compared to a conventional motor and can keep constant speed even at high rotation speeds.



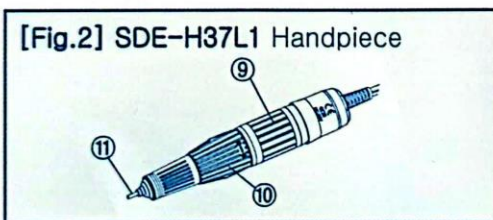
-  Read all safety instructions thoroughly before operating the unit.
Keep this user's manual in a safe place for future reference.

1. Compositions



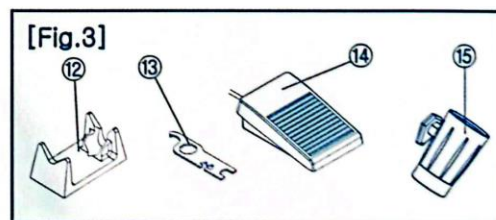
(1) Control Unit [Fig.1]

- ① Speed Control Knob
- ② Motor Connector
- ③ Power Switch
- ④ Forward/Reverse Selector
- ⑤ Hand/Foot Selector
- ⑥ Foot Pedal Connector
- ⑦ Power Cord
- ⑧ Input Voltage Selector



(2) Handpiece [Fig.2]

- ⑨ Micromotor
- ⑩ Chuck Handle



- ⑪ Bit

2. Accessories [Fig.3]

- ⑫ Handpiece Stand
- ⑬ Chuck Wrench
- ⑭ Foot Pedal (Option)
- ⑮ Handpiece Holder

3. Features

- (1) Forward / Reverse Rotation.
- (2) Non-stage speed dialing system.
- (3) Foot Pedal for on-off operation available as an option.

4. Precaution

- ★ Below Safety instructions must be read to avoid potential hazards that could result in personal injuries or damage to the unit.
- (1) Install the Control Unit in the room at suitable temperature(0~40°C).
Using it in an excessively dusty warm or humid location damages to the Control Unit.
- (2) When taking your Control Unit from the box, never let it fall on the floor.
Please handle with care.
- (3) Take care not to drop the handpiece. It will damage Ball Bearing or weaken durability of the handpiece.
- (4) Never plug or unplug the Power Cord with wet hands to avoid electric shock.
- (5) Never use damaged electric cable to avoid electric shock.
- (6) Do not insert too many power cords into one socket. It give rise to fire.
- (7) Be sure not to disassemble or alter the units.
- (8) Never allow water or other liquids to spill onto and into the control unit and the micro motor, as such could cause short-circuit, abnormal heating or other troubles by rusting of metal parts.
- (9) Consider the safety of the patient or customer first, and operate the unit carefully.
- (10) Use only in the dental treatment by an authorized personnel.
- (11) Do not use or leave the unit in a high heat environment such as in direct hot sun, in a parked car under hot sun, near fire or stove.
- (12) Always check the unit for looseness, vibration, sound, operating the temperature.
Check the unit at a distant before using on the patient.
If abnormality is detected, immediately stop operation, and call the dealer.
- (13) Always put the Handpiece on its stand while in use.
- (14) Please check Input Voltage SelectorⓈ, before plug in the outlet. The rated voltage of the control unit is 110V/220V. If the approved rated voltage is not used, the product may be troubled.

5. Operation Procedure

(1) Mounting and Removing of Bit

① For use H37L1 handpiece [Fig.4]

- a To remove a bit①, turn the Chuck Handle clockwise in the direction of the arrow until it clicks to stop, and pull out the bit.
- b To mount a bit, make sure that the chuck is in open position, insert a bit all the way into the chuck, and turn the Chuck Handle clockwise in the opposite direction until it clicks to stop.



⚠ Notice

- Always thoroughly clean the Collet Chuck and bit before reassembled.
- Always completely turn off before attempting to change the micro motor or the bit.
- Make sure to insert the bit shank all the way, until it touches the back of the Collet Chuck. Then tighten the Collet Chuck. If the bit is used while not inserted completely, it is very dangerous because it may come out by the vibration of itself, held before running the Handpiece.
- After replacing a bit, it is necessary to make sure that the Collet Chuck is securely.
- Do not turn the chuck release ring of the micro motor while the motor is in operation.
- Never use bent, asymmetrical or damaged bits. Always use standard bits.
- When the Handpiece is not in use, it is recommended a test bits be inserted into the Collet Chuck of the Handpiece.

(2) Operating of Motor

- Connect Motor Cord to the jack Motor Connector② on the front place of the control unit.
- Turn the Hand/Foot Selector⑤ to "H"(HAND) on the rear of the control unit.
- Turn on the power switch③ to start the motor. Turn it to Off to stop the motor.
- Turn the Forward/Reverse Selector④ to "FWD" to run the motor in the forward direction, or to "REV" to run it in the Reverse direction.
- Motor speed can be varied between 0 and 35,000 rpm by the Speed Control Knob①.

⚠ Notice

- While the Handpiece is running, DO NOT try to adjust the Chuck Handle to prevent the Control Unit from being damaged.
- Before operating the Forward/Reverse Selector to turn a rotating direction, it is surely required to make sure that the Micromotor has been stopped.
- Do not leave the Handpiece long in break state. Otherwise, it may be troubled or malfunctioned.

(3) For using optional Foot Pedal

- Connect the Foot Pedal⑭ plug to the jack marked as FOOT(Foot Pedal Connector⑥) in the rear of the control unit.
- Turn the Hand/Foot Selector⑤ to "F"(FOOT).
- Turn on the Speed control knob①.
- Step on the Foot Pedal⑭ to run the motor.

6.Safety Protection System

To protect the motor and the control unit from excessive motor current rise caused by overloading such as by failure of ball bearing, greater loading to the bit, etc., the current sensor activates, when the motor current rises above the preset value, to be shut off the power supply.

When this safety protection system functions, restart the unit.

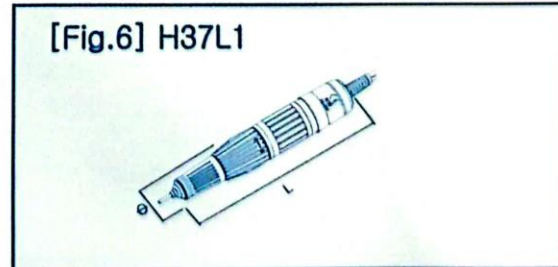
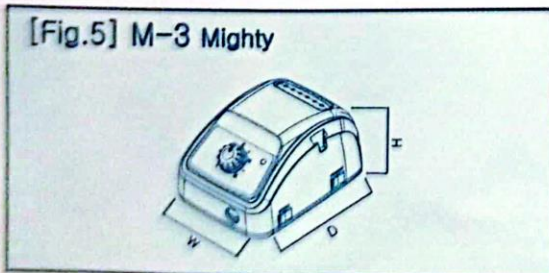
7. Trouble shooting

Troubles	Cause	Remedy
Motor fails to run.	(a) Loose connection motor plug with jack in control unit.	Correctly plug the Motor cord.
	(b) Defect in motor cord.	Replace motor cord.
	(c) Trouble in motor.	Check motor and repair if the motor is troubled.
Motor stops suddenly in use. (Safety protection system functioned.)	Overloaded, or Chuck is opened during operation.	See 6. Safety Protection System. Check the chuck and close the chuck if opened.
Motor fails to run when Foot Pedal is used.	(a) H/F Selector is at "H".	Set it at "F"
	(b) Foot Pedal fails to function.	Check and replace Foot Pedal.
	(c) Defect in Foot Pedal cord.	Check and replace Foot Pedal.
	(d) Loose connection Foot Pedal plug with jack in control unit.	Check Foot Pedal plug and connection.
	(e) Switch OFF.	Check Power Switch "ON".

If any malfunction case was found, please contact with the dealer the unit was purchased.

■ Specifications

M-3 Mighty	Input Voltage	Cycle	Output	Weight(g)	Dimension(mm)		
					W	D	H
	AC 110/220V	50/60Hz	DC 30V, 0.5A	1,260	118	156	78
H37L1 Handpiece	Input Voltage	Torque	Max. RPM	Weight(g)	Dimension(mm)		
					Φ	L	
	DC 30V, 0.5A	300gf·cm	35,000	214	28	153	





Surveyor II

Surveyor &
Milling Machine
Item #906-2

Figure 15 DENTAL SURVEYOR WITH MILLING MACHINE

USED FOR CREATING MILLED CROWNS AND SURVEYING OF CASTS AND PROSTHESES



USED FOR CREATING TEMPLATES AND SPLINTS

Figure 16 VACCUM FORMING MACHINE



ABBOTTABAD

USED FOR HEAT PROCESSING OF PMMA DENTURES

Figure 17 POLYMERIZING MACHINE



FULL CROWN MODULE FOR FINAL YEAR

BDS CLASS

DEPARTMENT OF PROSTHODONTICS

WOMEN DENTAL COLLEGE



Full Crown Module	Learner Level 1 Mastery of Tooth Preparation
Restoration / Tooth # Full Gold Crown (FGC) / 30 Extensions: Porcelain Fused to Metal (PFM) / 12 All Ceramic / 8	Estimated Set Up Time: 30 mins Estimated Completion Time: 6 hours

I. Module Information

In level 1 of the Full Crown Module, we are going to apply all the principles of preparing tooth to receive a full crown restoration. You will be guided with the step by step procedures in preparing tooth #30 (Fig. 1) that is going to be restored with a Full Gold Crown (FGC) (Fig. 2). An extension of the exercise is also included for further practice and efficiency.



Fig. 1. Pre-operative photo of tooth #30



Fig. 2. Prepared tooth #30 to receive FGC restoration

II. Setting up of the Articulated Teeth

Since this is a simulated exercise, tooth preparation should be done on a Frasco ® Model mounted on the simulator.

1. Get a typhodont tooth # 30.
2. You may also start setting up for your extensions and mount teeth # 12 and #8
3. Screw it on the space provided.
4. Make an alginate impression and pour it with the microstone.
5. Mount the articulator in the simulated patient.
6. Prepare silicone putty matrices of the tooth and the adjacent teeth
7. Prepare your instruments (handpiece, burs and mouth mirrors, etc.)

8. Have the evaluation criteria with you.



Clinical Relevance

As with any fixed prosthodontic procedure, you should always have a diagnostic cast to visualize your planned procedure. The silicone matrix will guide you during preparation as well as help you determine the adequacy of your tooth reduction. Take note that in some instances, silicone matrix may not be the best technique to use to evaluate your preparation. Other techniques, like using a *vacuum-formed matrix* may be more practical especially on teeth that are tilted, rotated or deviated from normal position. We will deal with these kinds of situation in the succeeding levels of the Full Crown Module.

III. Preparing Tooth for Full Crown Restoration

In the succeeding steps, we will be reducing the tooth structure per tooth surface. Although the sequence of surface to be reduced may vary according to operator's preference, our recommended steps would focus more on the goal(s) of each procedure and the amount of tooth structure to be reduced. As you begin your tooth preparation, read the full crown evaluation matrix to guide you in applying the principles of the tooth preparation.

Instructor's Note

Full Crown Preparation requires the understanding of the fundamental principles. As a review, these are:

- a. Conservation of tooth structure
 - Avoid weakening the tooth unnecessarily.
 - Avoid compromising the pulp.
- b. Resistance form
 - Prevent dislodgment of the restoration by apical or obliquely-directed forces.
- c. Retention form
 - Prevent dislodgement of the restoration by forces along the path of insertion, including the long axis of the tooth
- d. Structural durability.
 - Provide enough space for the crown which is sufficiently thick to prevent fracture, distortion or perforation.
- e. Marginal integrity
 - Prepare a finish line to accommodate robust margin with close adaptation to minimize microleakage.
- f. Preservation of the periodontium
 - Shape the preparation such that the crown is not over contoured and its margin is accessible for optimal oral hygiene.
- g. Esthetic Considerations
 - Create sufficient space for esthetic veneers where indicated

Make sure these principles make sense to you for they will surely guide you in your procedures. If you need further explanations of these principles, don't hesitate to ask your instructor.

A. Occlusal Surface Reduction

The goal of occlusal reduction is to provide 1.0 mm uniform reduction of occlusal surface and following the contour of the tooth. This can be accomplished with the help of depth grooves.

1. With your round-end tapered diamond bur, place the depth grooves (Fig.3) in the following areas:
 - a. primary development grooves
 - b. crest of the triangular ridges



Fig. 3. Occlusal Surface Depth Grooves/
Guides

2. Orient the bur parallel to the inner inclines.
3. With the sweeping movement, proceed to remove occlusal tooth structure to the predetermined depth by removing the islands of tooth structure between depth grooves.
4. Follow the up and down contours of the ridge and cusps inclines (Fig. 4).
 - a. Occlusal morphology is never flat.
 - b. Achieve Occlusal Planar Reduction-
-occlusal reduction following the planar contours of the tooth as they are presented pre-operatively.



Fig. 4. Occlusal Planar Reduction

5. Verify the uniformity and the amount of occlusal reduction (Fig 5). This can be done either by:
 - a. The silicone putty matrix
 - b. Articulating the maxillary and the mandibular arch
 - c. A softened piece of wax



Fig. 5. Occlusal Surface Reduction

Clinical Relevance

The amount of tooth structure removal including the amount of occlusal reduction depends on the type of restoration. For FGC, 1.0 mm reduction should be adequate to provide adequate space for the metal thickness without interfering with occlusion. However, in actual clinical cases, the clearance may vary and may require more tooth structure removal. You can use any of the suggested techniques to verify the adequacy of your reduction.

B. Buccal and Lingual Surfaces Reductions

The goals of Buccal and Lingual reductions are to remove adequate amount of teeth structures to (1) remove the natural undercut contour of the tooth and (2) achieve 6 degrees total occlusal convergence.

6. With your round-end tapered diamond bur, place the depth grooves in the following areas of the Buccal surface and extend apically upto 1.0 mm to the margin of the gingiva (Fig. 6).
 - a. development groove(s)
 - b. line angle(s)



Fig. 6. Buccal Surface Depth Grooves / Guides

7. Orient the bur at 3 degrees from the long axis of the tooth.
8. With the sweeping movement, proceed to remove the buccal tooth structures at a predetermined depth by removing the islands of tooth structure between depth grooves.
9. Make sure you remove all the natural undercut on unprepared tooth (Fig. 7).



Fig. 7. Removal of Undercuts

10. Re-orient your bur angulation to reduce the second plane of the buccal surface.
11. Follow the outline of the unprepared buccal contours (Fig. 8).



Fig. 8. Second Plane of Buccal Surface

12. Verify the uniformity and the amount of buccal reduction (Fig. 9) by:
- The silicone putty matrix



Fig. 9. Buccal Surface Reduction

13. Repeat the same procedure on the lingual surface making sure that the orientation of bur is at 3 degrees and extending the reduction apically upto 1.0 mm to the margin of the gingiva. There is, however, no second plane for the lingual surface (Fig. 10)



Fig. 10. Lingual Surface Reduction

14. Verify the removal of undercut (Fig. 11) and the amount of lingual reduction by:
- The silicone putty matrix



Fig. 11. Removal of Undercut

15. At this point we can begin developing our cervical margin by extending apically the margin from 1.0 mm to 0.5mm above the margin of the gingiva. The margin configuration is chamfer. However, completion of the cervical margin preparation can be done after reduction of all axial surfaces of the tooth.

C. Proximal Surface Reduction

The goals of proximal reduction are to (1) eliminate proximal contact with the adjacent teeth, and (2) create sufficient convergence to the occlusal surface.

16. Initial proximal cuts can be made with a smaller diameter round-end tapered diamond bur (Fig.12).



Fig. 12. Initial Proximal Reduction with smaller diameter bur

17. In a 'sawing motion' the thin diameter diamond bur is worked through the proximal area in occlusolingival and buccolingual direction. You can do this both in the mesial and distal surfaces.
18. Avoid contact with the adjacent teeth.
19. Once sufficient maneuvering room has been obtained, use the larger diameter round-end diamond bur to plane the walls and extending apically forming the chamfer margin at 0.5 mm above the margins of the gingiva (Fig. 13).



Fig. 13. Proximal Reduction with larger diameter bur

20. Maintain the taper of each surface at 3 degrees.
21. Verify the uniformity and the amount of proximal reduction by visually examining the 3 degrees taper, the 0.5mm chamfer margin and absence of tooth contact on the adjacent teeth (Fig. 14).



Fig. 14. Proximal Surface Reduction

D. Functional Cusp Bevel

The goal of functional cusp bevel is to reduce further the cuspal height by 0.5 mm on the functional cusp to provide adequate thickness of the restorative material on the area of significant functional loading.

22. Using the round-end tapered bur, depth grooves are placed at 45 degrees to the long axis of the tooth at the line angle created between the second plane of the buccal surface and occlusal surface (Fig. 15).



Fig. 15. Bur Angulation for Functional Cusp Bevel

23. With the sweeping movement, proceed to remove tooth structure to the predetermined depth by removing the islands of tooth structure between depth grooves.

24. Follow the up and down contours of the cusp heights.
25. A wide bevel should have been created on the area (Fig. 16).



Fig. 16. Functional Cusp Bevel

E. Margin Preparation

The goal of margin preparation is to establish a visible termination of the preparation that provides a definite finish line configuration. A chamfer configuration is required for FGC. The dimension is 0.5 mm and is placed 0.5mm supragingival all around the cervical area of the prepared tooth.

26. With a depth of 0.5mm, placed the round-end tapered bur 0.5 mm above the margin of the gingiva and define the rough removal of teeth structure previously performed along the cervical margin of the tooth.
27. Follow the contour of the margin of the gingiva.
28. Remove any rough and uneven surface along the margin.
29. Assure a smooth, even, definite chamfer margin (Fig. 17).



Fig. 17. Chamfer Margin Preparation

F. Finishing the Preparation

The goals of finishing the preparation are to (1) establish a smooth preparation devoid of irregularities (2) establish a well-defined and smooth margin configuration.

30. With the round-end tapered bur, smoothen all the axial surfaces of the preparation particularly removing all surface irregularities.
31. Round off all the sharp corners and areas
32. For the margins, use the round-end tapered finishing bur (fine-grit), to remove surface irregularities and provide smooth and well-defined margin finish (Fig.18).



Fig. 18. Finishing the Preparation



Fig. 19 A. Buccal View

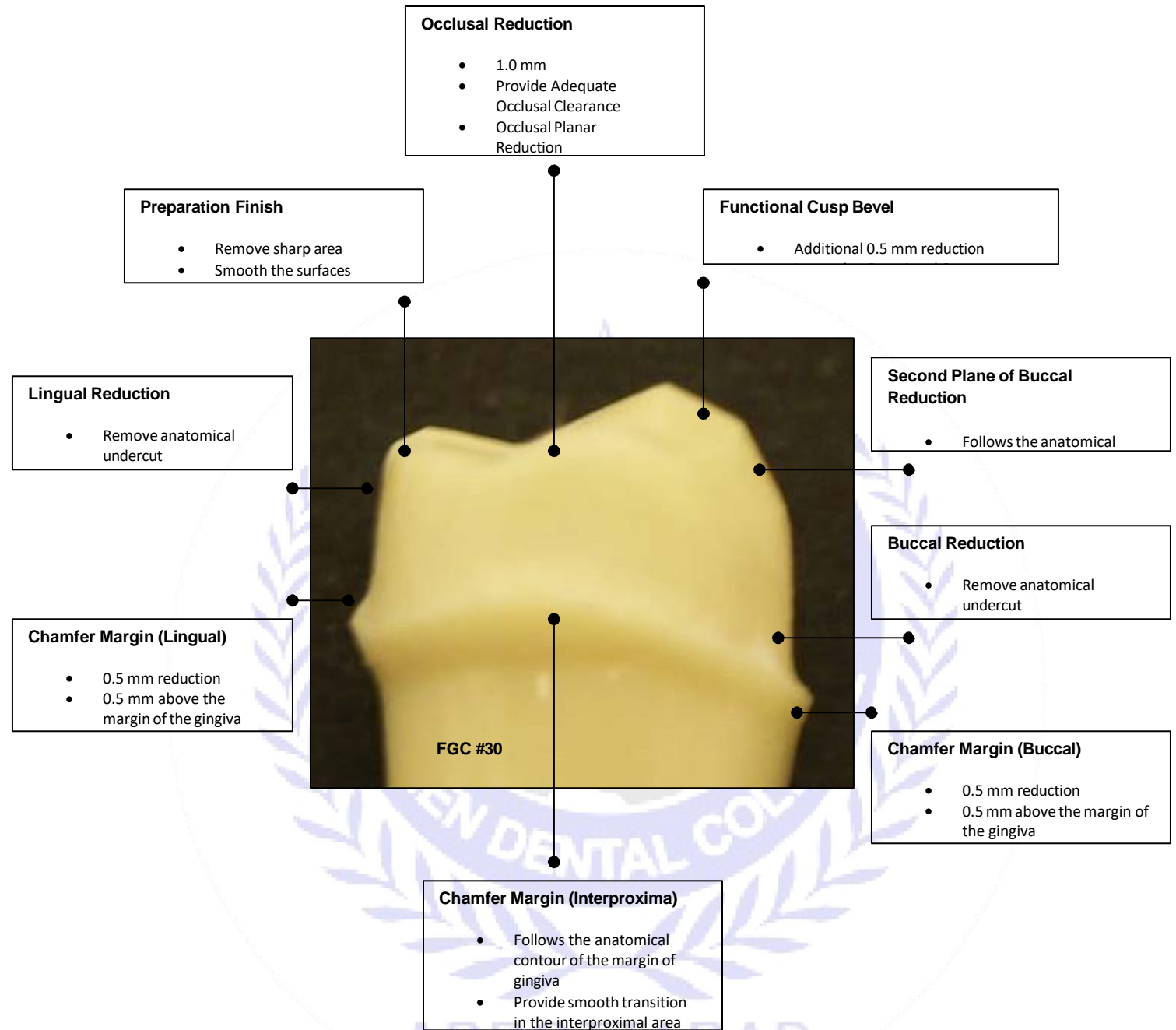


Fig. 19 B. Lingual View



Fig. 19 C. Occlusal Vie

Fig. 19 A to C.
Tooth Preparation on Tooth # 30
to receive Full Gold Crown



General Features of Full Gold Crown (FGC) Preparation for Posterior Teeth

IV. Evaluating the Preparation

Check your preparation using your silicone putty matrix. Visually inspect your preparation and evaluate your reductions on all the surfaces. Use the evaluation criteria. Below are some guide questions that may be helpful to determine the 'correctness' of your preparation. You may go back to your preparation if there is a need to modify.

1. Occlusal Reduction
 - a. Do you have 1.0 mm occlusal reduction? More? Less?
 - b. Did you follow the contours of the occlusal surface? Is it flat?
2. Buccal and Lingual Reductions
 - a. Is there an undercut left/ created?
 - b. Do you have 3 degrees taper on each surface? More? Less?
 - c. Do you have the second plane on your buccal surface?
3. Proximal Reduction
 - a. Did you eliminate the contact with the adjacent teeth?
 - b. Do you have sufficient occlusal convergence?
4. Functional Cusp Bevel
 - a. Did you provide an additional 0.5 mm reduction on the functional cusp?
 - b. Is it located in the area where functional loading occur?
5. Margin Preparation
 - a. Do you have a 0.5 mm chamfer margin configuration?
 - b. Is located 0.5 mm above the margin of the gingiva and following its contour?
6. Finishing the preparation
 - a. Is your preparation smooth and devoid of irregularities?
 - b. Is your margin well-defined and smooth

CONGRATULATIONS! You made it! You have finished Level 1 of the Full Crown Module. You may proceed doing the Module Extensions. In the extensions, you will prepare different teeth to receive different type of restorations. This will expand your understanding of the principles that were covered in this module and provide you with further practice and develop efficiency. Carry on!

Instructor's Notes on Module Extensions Level 1

The module extensions in level 1 are designed to further enhance your dexterity skills in teeth preparation not only for posterior teeth but also for anterior teeth. Also more importantly, for you to have an understanding of the difference of the preparation design for the specific type of restorative material (FGC, PFM, all-ceramic). In a nut-shell, each preparation varies in the amount of tooth reduction and the margin design, and I want you to take note of that.

Porcelain Fused to Metal (PFM) / 12

1. Set up your articulated tooth. Fabricate a silicone index.
2. Prepare your tooth. The preparation for full crown on tooth #12 to receive a PFM follows the same steps and sequence as the preparation for FGC in this module. However, the amount of reduction is generally greater than FGC. The following are the major differences:
 - a. Occlusal reduction – 1.5 mm
 - b. Buccal reductions-
 - 1.3 mm and 3-degree taper
 - Two-plane reduction required
 - c. Lingual reductions- 1.0 mm and 3-degree taper
 - d. Proximal reductions- no proximal contact, no undercut and sufficient convergence
 - e. Functional cusp bevel- 0.5 mm more on the functional cusp
 - f. Margin preparation-
 - 1.3 mm shoulder margin on the facial
 - 0.5 mm chamfer margin on the lingual
 - 0.5 mm above the margin of gingiva
 - Smooth transition of chamfer and shoulder margins along the interproximal area
 - g. Finishing your preparation – round off sharp angles and provide a smooth finish on the tooth.
3. Evaluate your preparation

Clinical Relevance

Porcelain Fused to Metal (PFM) crown is a restoration that covers the entire clinical crown of a tooth with both metal and porcelain material. Porcelain is incorporated in the area where there is esthetic concern. This is generally on the labial area, proximal area (most often on the mesial), occlusal area but rarely on the lingual cervical area. The porcelain coverage thus requires more teeth reduction to provide adequate thickness for strength and esthetics. Minimal tooth reduction is required on the lingual where there is no porcelain coverage and thus conserves more tooth structures.

Margin Junction (Interproxima)

- Follows the anatomical contour of the margin of gingiva
- Provide smooth transition between shoulder and chamfer in the interproximal

Shoulder Margin (Buccal)

- 1.3 mm reduction
- 0.5 mm above the margin of the gingiva

Buccal Reduction

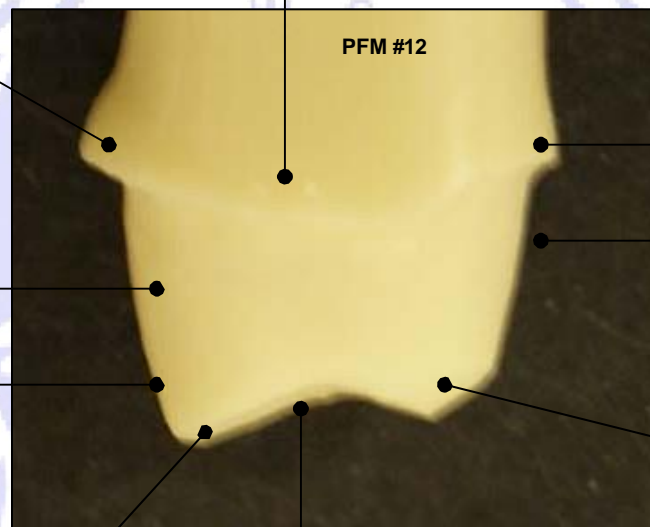
- Remove anatomical undercut

Second Plane of Buccal Reduction

- Follows the anatomical

Preparation Finish

- Remove sharp area
- Smooth the surfaces



Chamfer Margin (Lingual)

- 0.5 mm reduction
- 0.5 mm above the margin of the gingiva

Lingual Reduction

- Remove anatomical undercut

Functional Cusp Bevel

- Additional 0.5 mm reduction
- Located at Functional Cusp

Occlusal Reduction

- 1.5 mm
- Provide Adequate Occlusal Clearance
- Occlusal Planar Reduction

General Features of Porcelain Fused to Metal (PFM) Crown Preparation for Posterior Teeth

1. Set up your articulated tooth. Fabricate a silicone index.
2. Prepare your tooth. The preparation for full crown on tooth #8 to receive an All Ceramic restoration follows the same steps and sequence as the preparation for FGC in this module. However, the amount of reduction is generally greater than FGC. The following are the major differences:
 - a. Incisal reduction – 2.0 mm
 - b. Labial reductions-
 - 1.5 mm and 3-degree taper
 - Two-plane labial reduction required
 - c. Lingual Fossa reductions- 1.3 mm
 - d. Cingulum Reduction- 1.5 mm on margin and preserve as much cingulum height
 - e. Proximal reductions- no proximal contact, no undercut and sufficient convergence
 - f. Margin preparation-
 - 1.5 mm shoulder margin on the labial
 - 1.5 mm shoulder margin on the lingual
 - 0.5 mm above the margin of gingiva
 - Smooth transition margins along the interproximal area
 - g. Finishing your preparation – round off sharp angles and provide a smooth finish on the tooth.
 - h. Evaluate your preparation

Clinical Relevance

All ceramic restoration is an esthetic restoration. It is a restoration of choice for patients that demands higher esthetic requirements. Esthetics can be achieved with this type of restoration because unlike PFM, it does not have a metal substructure that affects the light translucency and can have the potential to mimic the translucency of a natural tooth. However, the main drawback of this restoration is its fracture resistance. It fractures easily thus care should be done in preparing the tooth and you should provide adequate thickness of porcelain for strength. Its use is recommended for anterior teeth though it can also be indicated for posterior teeth in well selected clinical cases.

Margin Junction (Interproxima)

- Follows the anatomical contour of the margin of gingiva
- Provide smooth transition in the interproximal area

Shoulder Margin (Lingual)

- 1.5 mm reduction
- 0.5 mm above the margin of the gingiva

ALL CERAMIC #8

Shoulder Margin (Buccal)

- 1.5 mm reduction
- 0.5 mm above the margin of the gingiva

Cingulum Reduction

- Preserve Cingulum Height and taper

Labial Reduction

- Remove anatomical undercut

Lingual Fossa Reduction

Second Plane of Labial Reduction

- Follows the anatomical

Preparation Finish

- Remove sharp area
- Smooth the surfaces

Incisal Reduction

- 2.0 mm
- Provide Adequate Incisal Clearance

General Features of All Ceramic Crown Preparation for Anterior Teeth